02-8906-24-PA
REV. NO. 0

FINAL DRAFT
PRELIMINARY ASSESSMENT
EASTERN SURGICAL DRESSINGS PLANT J.J.P
NORTH BRUNSWICK, NEW JERSEY

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-8906-24
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

SEPTEMBER 8, 1989

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY:

JOANN L. WAGNER
PROJECT MANAGER

RICHARD P. HUBNER
SITE MANAGER

REVIEWED/APPROVED BY:

RONALD M. NAMAN
FIT OFFICE MANAGER

198560

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

PART I: SITE INFORMATION

1. **Site Name/Alias** Eastern Surgical Dressings Plant J.J.P

   Street U.S. Route 1 and Aaron Road

   City North Brunswick **State** New Jersey **Zip** 08902

2. **County** Middlesex **County Code** 23 **Cong. Dist.** 06

3 **EPA ID No.** NJD000631937

4. **Latitude** 40° 26' 11" N **Longitude** 74° 30' 16" W

   USGS Quad. 7.5 minute series, Monmouth Junction and New Brunswick, New Jersey

5. **Owner** Johnson and Johnson Products **Tel. No.** 201 - 524-0400

   Street 501 George Street ESDP EE 292

   City New Brunswick **State** New Jersey **Zip** 08903

6. **Operator** Same as above **Tel. No.** _____

   Street _____

   City _____ **State** _____ **Zip** _____

7. **Type of Ownership**

   ☒ Private ☐ Federal ☐ State
   ☐ County ☐ Municipal ☐ Unknown ☐ Other _____

8. **Owner/Operator Notification on File**

   ☒ RCRA 3001 **Date** 8/7/80 ☐ CERCLA 103c **Date** _____
   ☐ None ☐ Unknown

9. **Permit Information**

Permit	Permit No.	Date Issued	Expiration Date	Comments
Unknown				

10. **Site Status**

    ☒ Active ☐ Inactive ☐ Unknown

11. **Years of Operation** 8/15/55 to Present

12. Identify the types of waste units (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.

(a) Waste Management Areas

Waste Unit No.	Waste Unit Type	Facility Name for Unit
1	Drum Storage Area	Outdoor Storage Area
2	Drum Storage Area	Hazardous Wastes Storage Facility

(b) Other Areas of Concern

Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.

Isolated violations concerning waste manifest(s) and improper storage methods have been associated with this site, but no spills, dumpings, etc. of hazardous wastes have been reported or are suspected.

13. Information available from

Contact Amy Brochu Agency U.S. EPA Tel. No. (201) 906-6802

Preparer Richard P. Hubner Agency NUS Corp. Region 2 FIT Date September 8, 1989

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 1 - Drum Storage Area, Outdoor Storage Area

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   The facility filed a Notification of Hazardous Waste Activity as a generator and a treatment, storage, or disposal (TSD) facility in August 1980. The facility later filed a RCRA Part A form in November 1980. TSD status was filed in the likelihood that drums might remain on site for more than 90 days. The exact age of the waste unit is unknown, but it may be at least 30 years old. This waste unit has been replaced by an indoor drum storage area. The waste unit is currently unused and is undergoing a RCRA closure.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The waste unit was a 30 feet x 62 feet concrete pad located in the rear of the facility adjacent to the processing buildings.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The number of drums stored in the waste area at any one time is unknown. According to the Notification of Hazardous Waste Activity, the facility had a process design capacity of 8250 gallons, or 150 55-gallon drums. The wastes were reportedly transferred off site within 90 days of generation.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The drums are assumed to have contained waste solvents and oils generated by the manufacturing processes and by processing machine(s) maintenance. Some solids (rags) were also likely to have been accumulated in drums. The rags were potentially contaminated with cleaning solvents used in the machine maintenance procedures.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   Wastes identified on the facility's August 1980 submittal included 2-butanone, carbamic acid, carbon tetrachloride, 1,3-benzenediol, methanol, methyl isobutyl ketone, naphthalene, nitrobenzene, phenol, toluene, 1,1,1-trichloroethane, and xylene.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   Beyond the use of a concrete slab, no berms or further forms of containment were known to exist for the waste unit.

Ref. Nos. 1, 2, 3, 4, 5, 6, 7, 8, 10, 11

PART II: WASTE SOURCE INFORMATION

For each of the waste units identified in Part I, complete the following six items.

Waste Unit 2 - Drum Storage Area, Hazardous Wastes Storage Facility

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   The facility filed a Notification of Hazardous Waste Activity as a generator and a treatment, storage, or disposal (TSD) facility in August 1980. The facility later filed a RCRA Part A form in November 1980. TSD status was filed in the likelihood that drums might remain on site for more than 90 days. The waste unit is approximately 3 years old and was constructed to replace the original (outdoor) storage area.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The waste unit is located adjacent to the processing buildings.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   Records indicate that the storage facility has a design capacity of 296 55-gallon drums. Approximately 14,800 gallons of potentially hazardous substance(s) may be stored on site.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The drums contain waste solvents and oils generated by the manufacturing processes and by processing machine(s) maintenance. Some solids (rags) are also accumulated in drums. The rags are potentially contaminated with cleaning solvents used in the machine maintenance procedures.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   Wastes identified on the facility's August 1980 submittal included 2-butanone, carbamic acid, carbon tetrachloride, 1,3-benzenediol, methanol, methyl isobutyl ketone, naphthalene, nitrobenzene, phenol, toluene, 1,1,1-trichloroethane, and xylene. According to a 1988 RCRA inspection report, waste tricresyl phosphate and waste materials containing polychlorinated biphenyls were also present and are commonly generated on site.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The waste unit is a complete containment facility with concrete spill protection, fire protection, and emergency spill collection tanks.

Ref. Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

PART III: HAZARD ASSESSMENT

GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

   There is an extremely limited likelihood of a release of contaminants to the groundwater as the wastes are presently stored in a complete containment facility. There is a potential for a release to have occurred previously when wastes were maintained outside; however, no spills of hazardous wastes have been documented.

   Ref. Nos. 1, 2, 3, 4, 5, 11

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

   The aquifer of concern underlying the Eastern Surgical Dressings Plant J.J.P. site is the Passaic Formation, formerly known as the Brunswick Formation. The aquifer consists of fractured Triassic bedrock of the Newark Group and is composed of red shale interbedded with siltstone, sandstone, and mudstone to a depth of 5000 feet. To the southeast, the Brunswick Formation is interconnected with the Farrington Sands group. The Farrington Sands are confined by the Woodbury Clay from above and the Raritan fire-clay from below. The Woodbury Clay is an extremely clayey silt layer approximately 50 feet thick, while the Raritan fire-clay is laminated clay and silt with minor gravel approximately 0 to 90 feet thick. The static water level in a well drawing from the Brunswick Formation and located approximately 2 miles west of the site was reported to occur at a depth of 45 feet. The exact depth to the water table beneath the site is unknown.

   Ref. Nos. 12, 13, 14, 15, 16, 19, 25

3. **Is a designated sole source aquifer within 3 miles of the site?**

   Although the Brunswick shale and sandstone aquifer is identified as a sole source aquifer, the geographical extent of the sole source delineation does not fall within 3 miles of the site.

   Ref. Nos. 12, 17

4. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

   The depth from the lowest point of waste disposal/storage, assumed to be the ground surface, to the highest seasonal level of the aquifer of concern is unknown.

   Ref. Nos. 11, 12, 15, 19, 25

5. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?**

   The least permeable continuous intervening stratum is unknown.

   Ref. Nos. 15, 16

6. **What is the net annual precipitation for the area?**

The net precipitation for the area is approximately 15 inches annually.

Ref. No. 18

7. **Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).**

Groundwater is used for industrial and domestic purposes within 3 miles of the site.

Ref. Nos. 15, 19, 20, 21, 22, 23, 24

8. **What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?**

Distance 10,900 feet **Depth** 279 feet

Ref. Nos. 12, 15

9. **Identify the population served by the aquifer of concern within a 3-mile radius of the site.**

Most of the population within a 3-mile radius is supplied by various water companies with well fields or surface water intakes outside the 3-mile radius. There are two domestic wells within a 3-mile radius that serve approximately 8 people.

Ref. Nos. 15, 19, 20, 21, 22, 23, 24

SURFACE WATER ROUTE

10. **Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility.**

There is an extremely limited likelihood of a release of contaminants to surface water, as the wastes are presently stored in a complete containment facility. There is a potential for a release to have occurred previously when wastes were stored outdoors; however, no spills of hazardous wastes have been documented.

11. **Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.**

The nearest downslope surface water is a tributary to Farrington Lake, located approximately 1500 feet southeast of the site. An intervening railroad track may act in such a manner as to prevent runoff from the site from entering the creek.

Ref. No. 12

12. **What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected.)**

The facility slope, based on an off-site reconnaissance conducted on July 24, 1989 by NUS Corp. Region 2 FIT, is estimated to be 0 to 3 percent.

Ref. Nos. 11, 12

13. **What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water.)**

The slope of the intervening terrain from the site to the unnamed stream is approximately 1 percent. The actual distance along a migration pathway is unknown.

Ref. Nos. 12

14. **What is the 1-year 24-hour rainfall?**

The 1-year 24-hour rainfall is estimated to be 2.75 inches.

Ref. No. 18

15. **What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.**

The nearest downslope surface water is a tributary to Farrington Lake, located approximately 1500 feet southeast of the site. However, the distance along the course that runoff would follow is unknown.

Ref. No. 12

16. **Identify uses of surface waters within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used).**

Designated uses of surface waters within 3 miles downstream of the site include primary and secondary contact recreation, municipal drinking water, industrial and agricultural water supply, and maintenance of biota.

Ref. No. 27

17. **Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.**

No coastal or freshwater wetlands, greater than 5 acres in area, exist within 2 miles downstream of the site.

Ref. No. 12

18. **Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.**

There are no critical habitats of federally listed endangered species within 2 miles of the site along the migration pathway.

Ref. No. 27

19. **What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?**

No sensitive environments exist along or contiguous to the migration pathway within 2 miles of the site.

Ref. Nos. 12, 27

20. Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).

No surface water intakes exist within a 3-mile radius of the site. The nearest surface water intake is on Farrington Lake, approximately 7 miles downstream from the site.

Ref. Nos. 12, 19, 20

21. What is the state water quality classification of the water body of concern?

The water bodies of concern have state water quality classifications of FW2-NT.

Ref. No. 26

22. Describe any apparent biota contamination that is attributable to the site.

No apparent biota contamination was observed during the off-site reconnaissance conducted by NUS Corporation Region 2 FIT on July 24, 1989.

Ref. No. 11

AIR ROUTE

23. Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.

No observed or alleged release of contaminants to the air has been documented. There is little likelihood of a release because wastes are stored in a fully contained waste storage building.

Ref. Nos. 1, 2, 3, 4, 5, 11

24. What is the population within a 4-mile radius of the site?

The population within 4 miles of the site is approximately 49,900.

Ref. No. 28

FIRE AND EXPLOSION

25. Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.

The potential for a fire or explosion to occur is extremely limited due to the fire containment system associated with the waste storage building.

Ref. Nos. 1, 2, 3, 4, 5, 11

26. What is the population within a 2-mile radius of the hazardous substance(s) at the facility?

The population within 2 miles of the site is approximately 8,400.

Ref. No. 28

DIRECT CONTACT/ON-SITE EXPOSURE

27. **Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.**

The potential for direct contact with hazardous substances is limited because wastes are stored in a fully contained waste storage area and 24-hour guardposts are present at the facility.

Ref. Nos. 1, 2, 3, 4, 5, 11

28. **How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?**

There are no known contaminated areas on the facility property.

Ref. Nos. 4, 5, 11

29. **What is the population within a 1-mile radius of the site?**

The population within 1 mile of the site is approximately 4,200.

Ref. No. 28

PART IV: SITE SUMMARY AND RECOMMENDATIONS

Eastern Surgical Dressings Plant J.J.P. is a privately-owned and operated active site, approximately 450 acres in size, located at U.S. Route 1 and Aaron Road, North Brunswick, Middlesex County, New Jersey.

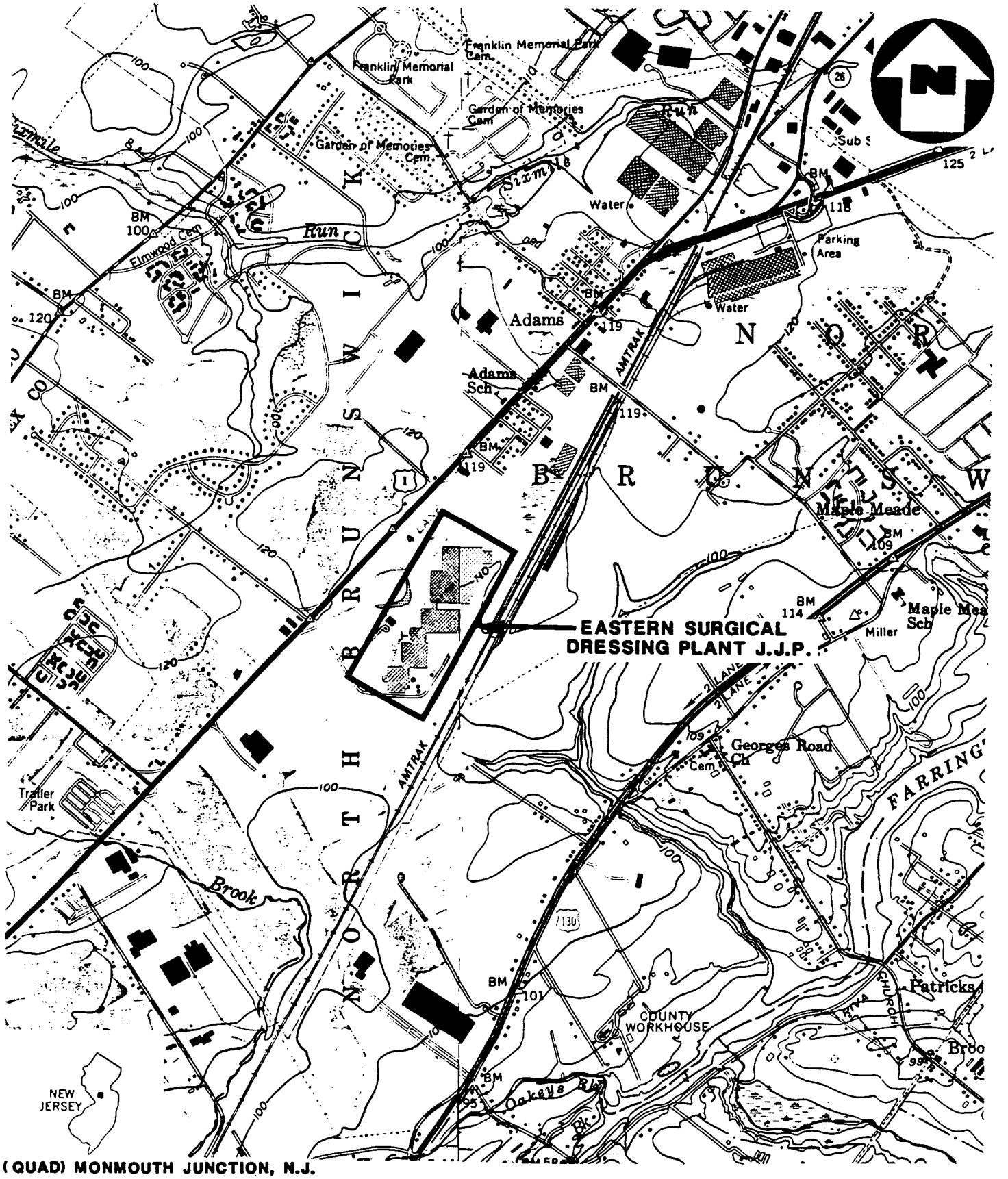
This facility is a manufacturing and distribution center of home and hospital health care products. Hazardous wastes are generated by the manufacturing processes and by the cleaning and maintenance of operations machines. These wastes may include tricresyl phosphate, 2-butanone, carbamic acid, carbon tetrachloride, 1,3-benzenediol, methanol, methyl isobutyl ketone, naphthalene, nitrobenzene, phenol, toluene, 1,1,1-trichloroethane, and xylene. Prior to 1987 the facility stored its wastes in drums on a concrete pad behind the processing buildings. After the construction of a complete containment waste storage building, the slab was cleaned and is undergoing closure according to RCRA specifications. Wastes are now stored in drums within a complete containment facility located adjacent to the processing buildings and are removed within 30 days of generation. The facility filed for and received a treatment, storage, or disposal (TSD) permit in August 1980 and has remained in full compliance except for minor manifest violations in September 1988. During an off-site reconnaissance conducted by NUS Corporation Region 2 FIT on July 24, 1989, it was noted that a guard house was located at the entrance to the facility.

Because all wastes are stored in a fully contained waste storage building and there are no documented reports of past spills or releases of hazardous substances, a recommendation of **NO FURTHER REMEDIAL ACTION PLANNED** is assigned to this site. The completeness of all documentation referring to this site and the apparent willingness on the part of Johnson and Johnson Products, Inc. to maintain permit status indicates little potential for a release of hazardous substances from this site.

ATTACHMENT 1

EASTERN SURGICAL DRESSINGS PLANT J.J.P.
NORTH BRUNSWICK, NEW JERSEY

CONTENTS



(QUAD) MONMOUTH JUNCTION, N.J.

SITE LOCATION MAP

EASTERN SURGICAL DRESSING PLANT J.J.P.

NORTH BRUNSWICK, N.J.

SCALE: 1"= 2000'

FIGURE 1

NUS CORPORATION

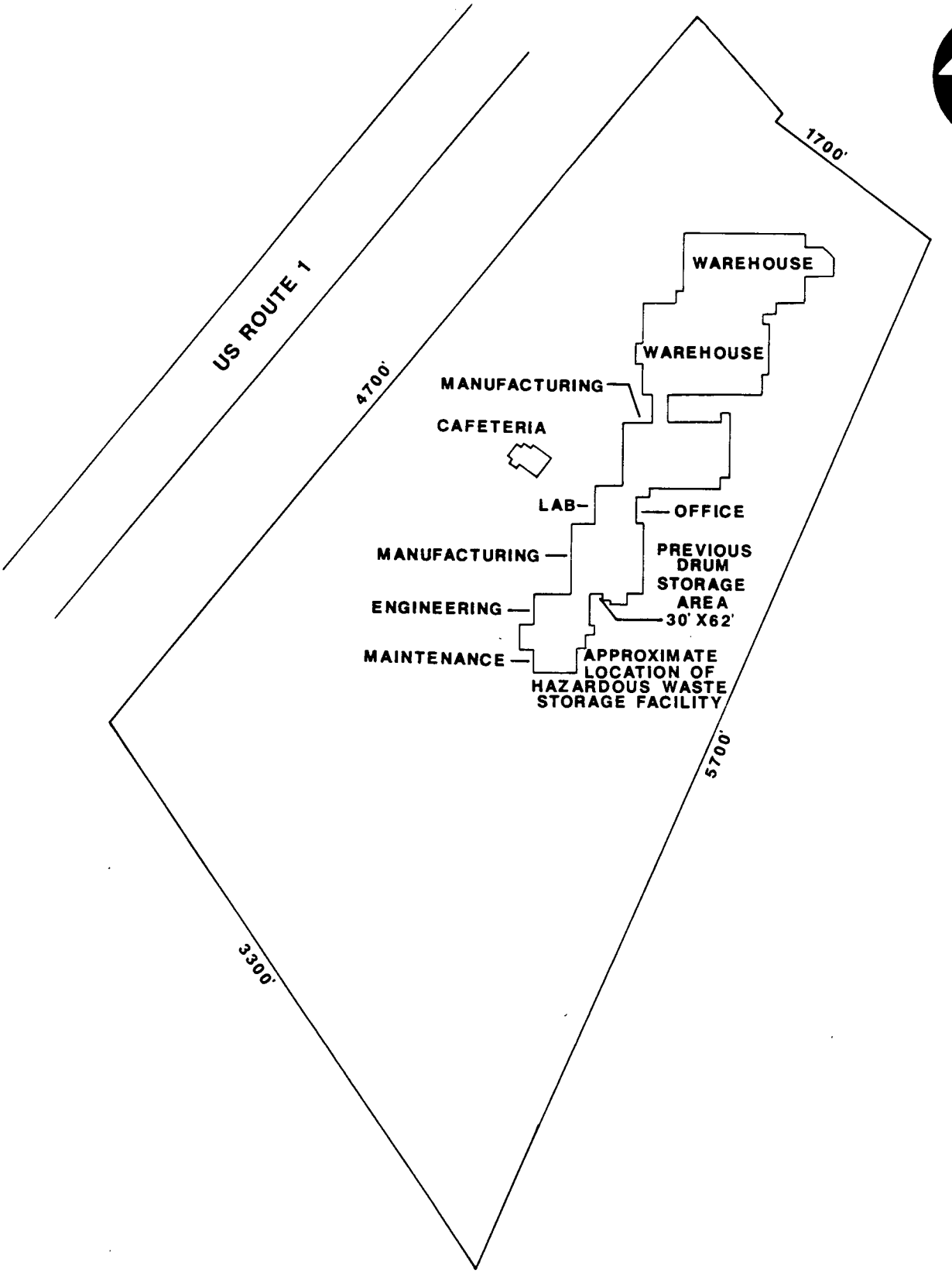


FIGURE 2

SITE MAP

EASTERN SURGICAL DRESSING PLANT J.J.P., NORTH BRUNSWICK, N.J.

SCALE UNKNOWN

NUS CORPORATION

EXHIBIT A

PHOTOGRAPH LOG

EASTERN SURGICAL DRESSINGS PLANT J.J.P.
NORTH BRUNSWICK, NEW JERSEY

OFF-SITE RECONNAISSANCE: JULY 24, 1989

EASTERN SURGICAL DRESSINGS PLANT J.J.P.
NORTH BRUNSWICK, NEW JERSEY
JULY 24, 1989

PHOTOGRAPH INDEX

ALL PHOTOGRAPHS TAKEN BY KURT FENDLER

Photo Number	Description	Time
R1P4	Panorama of site facing south from Route 1.	1101
R1P5	Panorama of site facing southeast from Route 1.	1101
R1P6	Panorama of site facing east from Route 1.	1102
R1P7	Panorama of site facing northeast from Route 1.	1102
R1P8	Panorama of site facing north from Route 1.	1102

EASTERN SURGICAL DRESSINGS PLANT J.J.P.
NORTH BRUNSWICK, NEW JERSEY

R1P4 July 24, 1989 1101
Panorama of site facing south from Route 1.

EASTERN SURGICAL DRESSINGS PLANT J.J.P.
NORTH BRUNSWICK , NEW JERSEY

R1P5 July 24, 1989 1101
Panorama of site facing southeast from Route 1.

EASTERN SURGICAL DRESSINGS PLANT J.J.P.
NORTH BRUNSWICK , NEW JERSEY

R1P6 July 24, 1989 1102
Panorama of site facing east from Route 1.

EASTERN SURGICAL DRESSINGS PLANT J.J.P.
NORTH BRUNSWICK , NEW JERSEY

R1P7 July 24, 1989 1102
Panorama of site facing northeast from Route 1.

EASTERN SURGICAL DRESSINGS PLANT J.J.P.
NORTH BRUNSWICK , NEW JERSEY

R1P8 July 24, 1989 1102
Panorama of site facing north from Route 1.

ATTACHMENT 2

REFERENCES

1. United States Environmental Protection Agency (EPA), Notification of Hazardous Waste Activity, EPA Form 8700-12 (6-80), August 7, 1980.

2. United States Environmental Protection Agency (EPA), General Information, Consolidated Permits Program, EPA Form 3510-1(6-80), November 19, 1980.

3. United States Environmental Protection Agency (EPA), Hazardous Waste Permit Application, EPA Form 3510-3(6-80), November 19, 1980.

4. New Jersey Department of Environmental Protection (NJDEP), Division of Waste Management Inspection Report, Eastern Surgical Dressings Plant J.J.P., September 23, 1987.

5. New Jersey Department of Environmental Protection (NJDEP), Division of Waste Management Inspection Report, Eastern Surgical Dressings Plant J.J.P., September 22, 1988.

6. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response (OSWER), Draft RCRA F-Solvent Land Restriction TSD Requirements Checklist, Form OSWER 9938.1, September 23, 1987.

7. Letter from Ernest J. Kuhlwein, Jr., Chief, Bureau of Hazardous Waste Engineering, NJDEP, to Mr. Steven Baldwin, Johnson and Johnson Products Inc., October 13, 1988.

8. Letter from Stephen Baldwin, Johnson and Johnson Products Inc., to Mr. Ernest J. Kuhlwein, Jr., Chief, Bureau of Hazardous Waste Engineering, NJDEP, December 6, 1988.

9. Telecon Note: Conversation between Mike Gage, New Jersey Department of Environmental Protection, Division of Hazardous Waste Management, and Richard P. Hubner, NUS Corp., July 27, 1989.

10. Wagner, Travis. The complete handbook of hazardous waste regulation. Perry-Wagner Publishing Co. 1988.

11. Preliminary Assessment Off-site Reconnaissance Information Reporting Form, Eastern Surgical Dressings Plant J.J.P., TDD 02-8906-24, NUS Corporation Region 2 FIT, Edison, New Jersey, July 24, 1989.

12. Three-Mile Vicinity Map for Eastern Surgical Dressings Plant J.J.P., based on U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5 minute series, "Monmouth Junction, NJ", 1943, photorevised 1970; "New Brunswick, NJ," 1939, photorevised 1970.

13. New Jersey State Water Policy Commission, The Ground-Water Supplies of Middlesex County, New Jersey, Special Report 8, 1943.

14. Middlesex County 208 Area-Wide, Waste Treatment Management Planning, Task 8, Ground-Water Analysis, Geraghty and Miller, Inc., November 1976.

15. Department of Conservation and Economic Development, Division of Water Policy and Supply, Well Record Nos. 28-2591, 28-7845, 28-4424.

16. Middlesex County Planning Board, Environmental Systems Section, Policies and Practices for Managing Middlesex County's Groundwater Resources, September 1974, Revised January 1979.

REFERENCES (CONT'D)

17. Brunswick Shale and Sandstone Aquifer of the Ridgewood Area, New Jersey, Final Determination, Federal Register, Vol. 49, No. 16, Tuesday, January 24, 1984.

18. Uncontrolled hazardous waste site ranking system, A user's manual, 40 CFR, Part 300, Appendix A, 1986.

19. State of New Jersey, Department of Environmetal Protection, Water Supply Overlay, Sheet 28, August 1975.

20. Telecon Note: Conversation between Mr. Ed O'Rourke, City of New Brunswick Water Department, and Joseph Dvorak, NUS Corp., April 14, 1989.

21. Telecon Note: Conversation between Secretary to the Water Department Director, East Brunswick Water Department, and Joseph Dvorak, NUS Corp., July 13, 1989.

22. Telecon Note: Conversation between Middlesex Water Company, and Magda Trujillo, NUS Corp., July 18, 1989.

23. Telecon Note: Conversation between Mr. D. Krebs, North Brunswick Township Water Department, and Joseph Soriano, NUS Corp., July 14, 1989.

24. Telecon Note: Conversation between Mr. Gerald Schwear, South Brunswick Municipal Utilities - Water Supply, and Valerie Mathers, NUS Corp., July 25, 1989.

25. United States Geological Survey, Selected information of wells from the groundwater site inventory database, Middlesex County, February 20, 1986.

26. State of New Jersey Department of Environmental Protection, Division of Water Resources, Surface Water Quality Standards, N.J.A.C. 7:9-4.1, Index E-Surface Water Classifications of the Raritan River and Raritan Bay Basin, May 1985.

27. U.S. Department of the Interior, U.S. Fish and Wildlife Service, Atlantic Coast Ecological Inventory, Newark NJ-NY-PA, 1980.

28. General Sciences Corporation, Graphical Exposure Modeling System (GEMS). Landover, Maryland, 1986.

REFERENCE NO. 1

EPA

ENVIRONMENTAL PROTECTION AGENCY

NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

INSTALLATION'S EPA I.D. NO.	PLEASE PLACE LABEL IN THIS SPACE
I. NAME OF INSTALLATION	
II. INSTALLATION MAILING ADDRESS	
III. LOCATION OF INSTALLATION	

INSTRUCTIONS: If you received a preprinted label, apply it in the space at left. If any of the information on the label is incorrect, draw a line through it and enter the correct information in the appropriate section below. If the label is complete and correct, leave items I, II, and III below blank. If you did not receive a preprinted label, complete all items. "Installation" means a site at which hazardous waste is generated, treated, stored and/or disposed of, or a transporter's principal place of business. Please refer to the INSTRUCTIONS FOR FILING NOTIFICATION before completing this form. The information requested herein is required by law *(Section 3010 of the Resource Conservation and Recovery Act).*

DETACH

FOR OFFICIAL USE ONLY

COMMENTS: C

INSTALLATION'S EPA I.D. NUMBER	APPROVED	DATE RECEIVED (yr., mo., & day)
B F NJD000631937 T/A 2 C 1		800807

I. NAME OF INSTALLATION

EASTERN SURGICAL DRESSINGS PLT JJP INC

II. INSTALLATION MAILING ADDRESS

STREET OR P.O. BOX: C 3501 GEORGE STREET ESDP EE292

CITY OR TOWN	ST.	ZIP CODE
C 4 NEW BRUNSWICK	NJ	08903

III. LOCATION OF INSTALLATION

STREET OR ROUTE NUMBER: C 5 US ROUTE 1 & AARON ROAD

CITY OR TOWN	ST.	ZIP CODE
C 6 NORTH BRUNSWICK	NJ	08902

IV. INSTALLATION CONTACT

NAME AND TITLE (last, first, & job title)	PHONE NO. (area code & no.)
C 2 SHORTE CECIL SR PROJ ENGINEER	201-524-4361

V. OWNERSHIP

DETACH

A. NAME OF INSTALLATION'S LEGAL OWNER: C 8 JOHNSON & JOHNSON PRODUCTS INC

B. TYPE OF OWNERSHIP (enter the appropriate letter into box): M

F = FEDERAL
M = NON-FEDERAL

VI. TYPE OF HAZARDOUS WASTE ACTIVITY (enter "X" in the appropriate box(es))

- [X] A. GENERATION
- [ ] B. TRANSPORTATION (complete item VII)
- [X] C. TREAT/STORE/DISPOSE
- [ ] D. UNDERGROUND INJECTION

VII. MODE OF TRANSPORTATION (transporters only – enter "X" in the appropriate box(es))

- [ ] A. AIR
- [ ] B. RAIL
- [ ] C. HIGHWAY
- [ ] D. WATER
- [ ] E. OTHER (specify):

VIII. FIRST OR SUBSEQUENT NOTIFICATION

Mark "X" in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your installation's EPA I.D. Number in the space provided below.

- [X] A. FIRST NOTIFICATION
- [ ] B. SUBSEQUENT NOTIFICATION (complete item C)

C. INSTALLATION'S EPA I.D. NO.

IX. DESCRIPTION OF HAZARDOUS WASTES

Please go to the reverse of this form and provide the requested information.

W | U | S | D | O | C | P | 0 | 2 | 1 | 7 | 2 | 1 | 2 | 4 | 1

IX. DESCRIPTION OF HAZARDOUS WASTES *(continued from front)*

A. HAZARDOUS WASTES FROM NON–SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.31 for each listed hazardous waste from non–specific sources your installation handles. Use additional sheets if necessary.

1	2	3	4	5	6
F001	F003	F005			
7	8	9	10	11	12

B. HAZARDOUS WASTES FROM SPECIFIC SOURCES. Enter the four–digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30

C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES. Enter the four–digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

31	32	33	34	35	36
U154	U159	U161	U165	U169	U188
37	38	39	40	41	42
U201	U211	U220	U226	U238	U239
43	44	45	46	47	48

D. LISTED INFECTIOUS WASTES. Enter the four–digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

49	50	51	52	53	54

E. CHARACTERISTICS OF NON–LISTED HAZARDOUS WASTES. Mark "X" in the boxes corresponding to the characteristics of non–listed hazardous wastes your installation handles. *(See 40 CFR Parts 261.21 – 261.24.)*

[X] 1. IGNITABLE (D001)	[X] 2. CORROSIVE (D002)	[X] 3. REACTIVE (D003)	[X] 4. TOXIC (D000)

X. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE	NAME & OFFICIAL TITLE *(type or print)*	DATE SIGNED
J. T. Anstatt	Director of Manufacturing	8-6-80

EPA Form 8700-12 (6-80) REVERSE

DETACH

DETACH

REFERENCE NO. 2

(Print—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

NJD000631937

	X	
	X	
X		X
	X	
	X	

	X	
	X	
	X	
	X	
	X	

EASTERN SURGICAL DRESSINGS PLANT JJP INC.

STONE GEORGE SENIOR ENGINEER 201 524 4679

501 GEORGE STREET ESDP EE 292

NEW BRUNSWICK NJ 08903

US ROUTE 1 & AARON ROAD

MIDDLESEX

NORTH BRUNSWICK NJ 08902

EPA Form 3510-1 (6-80)

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

3 8 4 2	(specify) SURGICAL DRESSINGS MANUFACTURE	2 8 4 4	(specify) PERFUME COSMETICS AND OTHER TOILET PREPARATIONS
2 8 3 4	(specify) DISTRIBUTION OF PHARMACEUTICALS	4 9 3	(specify) BUILDING UTILITIES GENERATION

J O H N S O N & J O H N S O N P R O D U C T S I N C O R P O R A T E D ☒ ☐

☐ (specify) 2 0 1 5 2 4 0 4 0 0

5 0 1 G E O R G E S T R E E T

N E W B R U N S W I C K N J 0 8 9 0 3 ☐ ☒

~~N A~~	~~N A~~	
~~N A~~	~~N A~~	(specify)
~~N O N E~~	~~N A~~	(specify)

MANUFACTURER OF SURGICAL DRESSINGS, ORTHOPEDIC AND PROFESSIONAL MEDICAL PRODUCTS.
DISTRIBUTOR OF ABOVE AND HEALTH CARE PRODUCTS IN BABY, ATHLETIC, DERMATOLOGICAL AND PHARMACEUTICAL MARKETS.
GENERATION OF HIGH TEMPERATURE AND COOLING WATER AND DISTRIBUTION OF WATER, GAS AND COMPRESSED AIR.

F9: A / S1

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Vice-President, Operations, JJP		11/19/80

REFERENCE NO. 3

(fill—in areas are spaced for elite type, i.e., aracters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

F N J D 0 0 0 6 3 1 9 3 7 3 1

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS
	8 0 1 1 1 9	

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

[X] 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

YR.	MO.	DAY
5 5	0 8	1 5

[ ] 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

YR.	MO.	DAY

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

[ ] 1. FACILITY HAS INTERIM STATUS

[ ] 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP T/A C 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 1	8250 000	G		7				
2					8				
3					9				
4					10				

Continued from the front.

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "T04")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER – Enter the four–digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four–digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY – For each **listed waste** entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each **characteristic** or **toxic contaminant** entered in column A estimate the total annual quantity of all the non–listed waste*(s)* that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE – For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each **listed** hazardous waste entered in column A **select the code***(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non–listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, **select the code***(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non–listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER – Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* – A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non–listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

NO.	A. EPA HAZARD. WASTE NO (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

Continued from page 2.

NOTE: Photocopy this page before comple if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)														FOR OFFICIAL USE ONLY						
W	N	J	D	0	0	0	6	3	1	9	3	7	3	W	DUP		3	2	DUP	

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	F001	3,600000	P	S01	
2	F003	164,0000000	P	S01	
3	F005	12,000000	P	S01	
4	U002	250000	P	S01	
5	U044	300000	P	S01	
6	U052	5000	P	S01	
7	U057	60000	P	S01	
8	U082	1000	P	S01	
9	U112	50000	P	S01	
10	U121	450000	P	S01	
11	U123	10000	P	S01	
12	U125	1000	P	S01	
13	U138	1000	P	S01	
14	U144	5000	P	S01	
15	U154	600000	P	S01	
16	U159	10000	P	S01	
17	U161	10,000000	P	S01	
18	U169	5000	P	S01	
19	U188	5000	P	S01	
20	U201	1000	P	S01	
21	U211	50000	P	S01	
22	U220	50000	P	S01	
23	U226	2,000000	P	S01	
24	U238	60000	P	S01	
25	U239	52,000000	P	S01	
26	D001	4,000000	P	S01	

EPA Form 3510-3 (6-80)

CONTINUE ON REVERSE

Continued from page 2.
NOTE: Photocopy this page before comple if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	T/A C	FOR OFFICIAL USE ONLY	T/A C	
W NJD000631937	1	W DUP	2	DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	D002	900 000	P	S01	
2	D003	450 000	P	S01	
3	D000	20,000 000	P	S01	
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

EPA Form 3510-3 (6-80)

CONTINUE ON REVERSE

V. DESCRIPTION OF HAZARDOUS WASTES (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

F6: A 55 F6: A 56

EPA I.D. NO. (enter from page 1)

													T/A	C
N	J	D	0	0	0	6	3	1	9	3	7		3	6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground–level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail).*

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)	LONGITUDE (degrees, minutes, & seconds)
40 26 11 0	074 30 16 0

VIII. FACILITY OWNER

[X] A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. (area code & no.)
~~N A~~	

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
~~N A~~	C G ~~N A~~		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
QWE A. J. Vitarius Vice-President, Operations, JJP		11/19/80

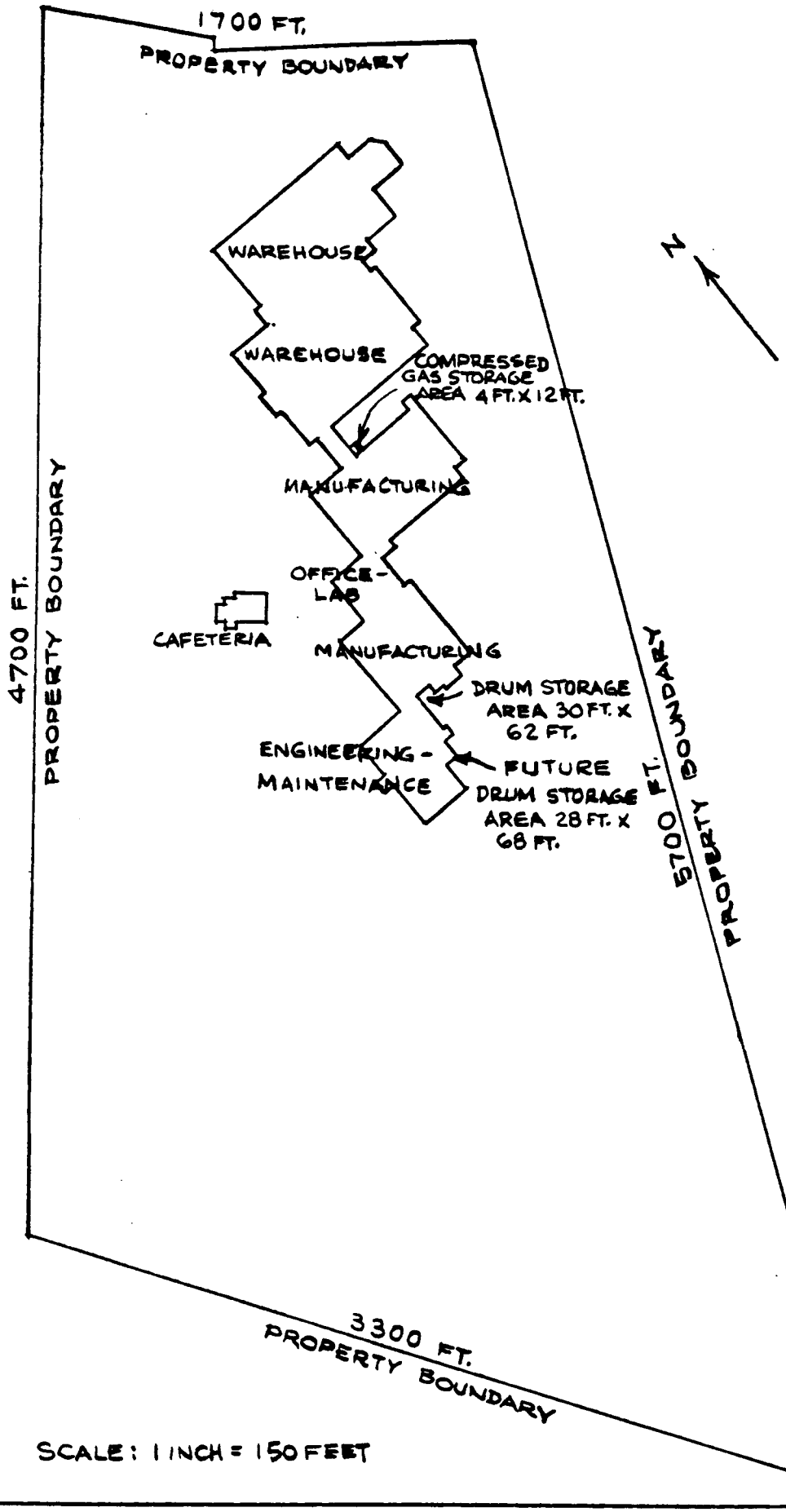
X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

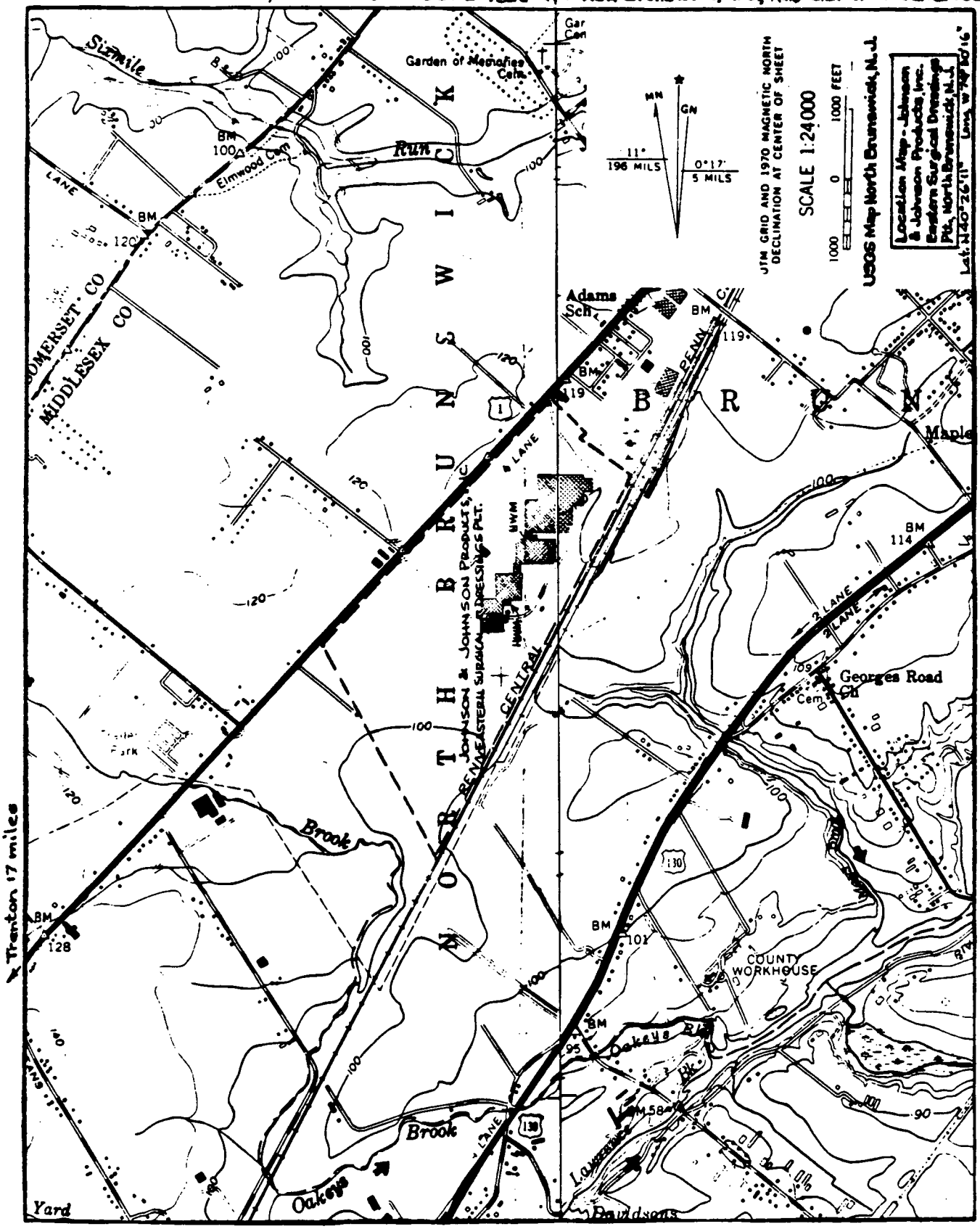
A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED

V. FACILITY DRAWING *(see page*

EPA ID NO. NJD000631937



Monmouth Junction N.J. AMS 6064 I NE Series V822 ←→ New Brunswick, N. J., AMS 6164 IV NW Series V822



REFERENCE NO. 4

WM-029 NEW J.. DEPARTMENT OF ENVIRONMENTAL P. TECTION 12-14-02
DIVISION OF WASTE MANAGEMENT

INSPECTION REPORT

REPORT PREPARED FOR:

- [x] Generator
- [ ] Transporter
- [x] HWM (TSD) Facility

FACILITY INFORMATION

Name: Eastern Surgical Dressing

Address: Us RT 1 & Aaron Rd
North Brunswick

Lot: _____ Block: _____

County: Middlesex

Phone: (201) 422-5469

EPA ID#: NJD000631937

Date of Inspection: 9/23/87

PARTICIPATING PERSONNEL

State or EPA Personnel: Peter Taylor
Wolf Stacel

Facility Personnel: J. D. Herring
A. E. Szura

Report Prepared by Name: Peter Taylor

Region: C. F. O.

Telephone#: (609) 426-0700

Reviewed by: Linda E. [illegible]

Date of Review: 10-9-87

FACILITY NAME: Eastern Surgical Dressing

ADDRESS: US 1 & Aaron St

North Brunswick

TIME IN: 0930

COUNTY: Middlesex

TIME OUT: 13:15

EPA ID : NJD000631937

DATE OF INSPECTION: 9/24/87

PHOTOS TAKEN ☐ YES ☒ NO

If yes, how many? _____

SAMPLE TAKEN ☐ YES ☒ NO NO. OF SAMPLES _____

NJDEP ID # _____

MANIFESTS REVIEWED ☒ YES ☐ NO

Number of manifests in compliance 65

Number of manifests not in compliance 0

List manifest document numbers of those manifests not in compliance.

NFIDENTIAL – RECOMMENDATIC

TO: Linda Jordan

FROM: Pete Taylor

DATE: 9/23/87

SUBJECT: Eastern Surgical Supply

Eastern Surgical Supply is now attempting to recover Xylene By distillation. There have been No shipments of Xylene since June.

They have build a New Storage Building Next To the old pad. This is a Fully Sprinklered Building. The Hazardous waste is palettized and each palette sits on Steel Shelving. This Shelving is 3 high and sits along the 2 Sidewalls. Each Level is Sprinklered. The Drums are 2 Deep against the wall (no aisle space), but Labels are visible & there is a Tracking system that tells what is in each Drum and where it's located. Although there is no Aisle space, The System is Thoroughly protected with Sprinklers, Exhaust Fans, Locked Doors (Keys) and Floor Drain Catch Basins, and Labels are visable.

This Building has To be Listed in Their Closure Plan & in Part "A". This is Being Done

A Land Band Inspection was also Performed at This Time

SUMMARY OF FINDINGS

FACILITY DESCRIPTION AND OPERATIONS

Eastern Surgical supplies is a wholly own subsidiary of Johnson & Johnson located on 100 acres of Farmer's marsh land. It was established in 1951. There are approximately 600 employees

This facility manufactures Band aids, surgical tapes, and other Surgical Dressings. It also serves as a distribution center for Johnson & Johnson products

Solvents are used to convey Liquid adhesive to coat backing material which is cut into rolls. This is combined with an absorbent pad. Waste solvents are generated in this process and in the cleaning of equipment. Wastes are also created by degreasing operations. Waste oils are generated by gear oil for maintenance

Hazardous Storage has been roofed & 1/2 enclosed. Trichrosyl phosphate is recovered & Xylene is stored in the roofed area. The enclosed area is used for Xylene distillation for recovery A new Building next to enclosed area now handles rest of Hazardous wastes

Describe the activities that result in the generation of hazardous waste.

(1) CASEIN (NON FLAMMABLE) LIQUID WASTE) BECAUSE OF A SHORT SHELF LIFE 72hr

(2) OILS – CUTTING, LUBE, QUENCHING OILS FROM SEMI ANNUAL P.M.

(3) XYLENE, DEGREASING & CLEANING OF MACHINERY – FLAMMABLE LIQUID WASTE

(4) RAGS & SOLID WASTE MATERIAL USED IN CLEAN UP COATED WITH XYLENE

(5) TRICRESYLPHOSPHATE – USED IN COATING OPERATION VAPORS COLLECTED IN SCRUBBER & DRUMMED

Identify the hazardous waste located on site, and estimate the approximate quantities of each. (Identify Waste Codes)

(6) SOLID & LIQUID FLAMMABLE WASTE FROM XYLENE RECOVERY

1/4 DRUM 55gal TRICRESYLPHOSPHATE } STORED IN OLD AREA

60 DRUMS XYLENE

36 DRUMS OIL

40 DRUMS OIL &

GENERATOR INSPECTION CHECKLIST

		YES	NO	N/A
7:26-8.5	Hazardous waste determination			
	(a) Did the generator test its waste to determine whether it is hazardous?	✓	—	—
	Is the waste hazardous? yes flammable / vapor of Xylene & Thermal material	✓	—	—
7:26-8.5(b)2	Is the generator determining that its waste exhibits a hazardous waste characteristic(s) based on its knowledge of the material(s) or processes used?	✓	—	—
	Has hazardous waste been shipped off site since November 19, 1980?	✓	—	—
	If yes, how many shipments, off site, have been made and describe the approximate size of an average shipment made on a monthly basis. If facility is a small quantity generator, please explain. 1 Shipment 6-8 wks of 75-80 drums F003- Xylene Solvent			
7:26-7.4(a)1	Does the generator have an EPA ID #?	✓	—	—
7:26-7.4(a)4	Does each manifest have the following information? Please circle the elements missing and obtain a copy of the incomplete manifests. (List those manifests that are deficient)	✓	—	—
7:26-7.4(a)4i	The generator's name, address and phone number?	✓	—	—
7:26-7.4(a)4ii	The generator's EPA ID number?	✓	—	—
7:26-7.4(a)4iii	The transporter(s) name, address and phone number?	✓	—	—
7:26-7.4(a)4iv	The transporter(s) EPA ID number?	✓	—	—
7:26-7.4(a)4v	The name, address and phone number of the designated TSD facility?	✓	—	—
7:26-7.4(a)4vi	The TSDF's EPA ID number?	✓	—	—
7:26-7.4(a)4vii	The name, type and quantity of hazardous waste being shipped, including such particulars as may be required regarding same?	✓	—	—

		YES	NO	N/A
7:26-7.4(a)4viii	Special handling instructions and any other information required on the form to be shipped by the generator?			
7:26-7.4(a)5	Before allowing the manifested waste to leave the generator's property, did the generator:			
7:26-7.4(a)5i	Sign the manifest certification by hand?	/		
7:26-7.4(a)5ii	Obtain the handwritten signature of the initial transporter and date of acceptance on the manifest?	/		
7:26-7.4(a)5iii	Retain one copy and forward one copy to the state of origin and one copy to the state of destination?	/		
7:26-7.4(a)5iv	Give remaining copies of the manifest form to the transporter?	/		
7:26-7.4(f)1	Has the generator maintained facility records for three (3) years? (Manifest(s), exception report(s) and waste analysis)	/		
7:26-7.4(h)1	Has the generator received signed copies of portion B (from the TSD facility) of all manifests for waste shipped off site more than 35 days ago?	/		
7:26-7.4(h)2	If not:			
	1. Did the generator contact the hauler and/or the owner or operator of the TSDF and the NJDEP at 609-292-9877 to inform the NJDEP of the situation, and			/
	2. Have exception reports been submitted to the Department covering any of these shipments made more than 45 days ago?			/
	Before transporting or offering hazardous waste for transportation off site, does the generator?			
7:26-7.2(a)	Conspicuously lable appropriate manifest numbers on all hazardous waste containers that are intended for shipment?	/		
7:26-7.2(b)	Insure that all containers used to transport hazardous waste off site are in conformance with applicable DOT regulations (i.e., 49 CFR 171 - 49 CFR 179)?	/		

		YES	NO	N/A
7:26-9.3	Accumulation time			
	How is waste accumulated on site?			
	☑ Containers			
	☐ Tanks (complete HWMF checklist)			
	☐ Aboveground ☐ Below ground			
	☐ Surface impoundments (complete HWMF checklist			
	☐ Piles (complete HWMF checklist)			
7:26-9.3(a)3	Is each container clearly dated with each period of accumulation so as to be visible for inspection?	✓	—	—
7:26-9.3(a)1	Is waste accumulated for more than 90 days?	✓	—	—
	If yes, complete HWMF checklist.			

STOP HERE IF THE HAZARDOUS WASTE MANAGEMENT FACILITY (TSD) CHECKLIST IS FILLED OUT.

REFERENCE NO. 5

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISIC OF HAZARDOUS WASTE MANAGE NT
HAZAR_JUS WASTE INSPECTION REPOR.

DWM-029

HAZARDOUS_WASTE_MANAGEMENT_FACILITY_INSPECTION_REPORT

FACILITY INFORMATION

EPA ID #: NJD000631937

FILE NUMBER: 12-14-02

VHT FACILITY FILE NUMBER: ---

REGION: Central

INSPECTION DATE: September 22, 1988

INCIDENT/CASE NUMBER: ---

INSPECTION TYPE: RCRA ISD Facility

RESPONSIBLE AGENCY CODE: ---

INSPECTOR'S NAME: Michael P. Gage

INSPECTOR'S AGENCY: New Jersey Department of Environmental Protection
Division of Hazardous Waste Management

INSPECTOR'S BUREAU: Central Bureau of Field Operations

FACILITY NAME: Johnson + Johnson Health Care
Eastern Surgical Dressing Plant

ADDRESS:
U.S. Route 1 North + Aaron Road

North Brunswick, Middlesex County, New Jersey

LOT: 5 BLOCK: 148

COUNTY: Middlesex

FACILITY PERSONNEL: John Kenyon - Hazardous Materials Supervisor
Stephen Baldwin - Hazardous Waste Manager
Hank Key - Building Services Manager

TELEPHONE #: (201) 422-5004

OTHER STATE/EPA PERSONNEL: ---

REPORT PREPARED BY: Michael P. Gage

REVIEWED BY: Frank Z. [illegible]

DATE OF REVIEW: 12-15-88

REVISION: 2
11/87

PHOTOS TAKEN: (__) YES (✓) NO

SAMPLE TAKEN: (__) YES (✓) NO

If yes, how many?

NO. OF SAMPLES: — NJDEP ID #: —

MANIFESTS REVIEWED: (✓) YES (__) NO

Number of Manifests in Compliance: 17

Number of Manifests Not in Compliance: 2

List Manifest Document Numbers of Those Manifests Not in Compliance:

1) NJA 0297347

Actual Description - "Waste Chemical Process Liquid, x-900
Trichloro tr. Fluoroethane - Non-hazardous

Correct Description: "Waste ORM-A NOS ORMA NA 1693 F001
(Trichlorotrifluoroethane)

These discrepancies were previously corrected by Mansol Inc. A Notice of Violation was issued by Wolf Skacel on 04/13/88 concerning the violations [(7:26-8.5(a)) Any person generating a solid waste shall determine if waste is hazardous]

2) SC 08304 "RQ Waste Flamable Liquid, NOS DOT,
- no NOS description provided in Section 5.

SUMMARY OF FINDINGS

FACILITY DESCRIPTION AND OPERATIONS

The Eastern Surgical Dressings Plant (ESDP) owned and operated by Johnson & Johnson Health Cure is located on a 450-acres site in North Brunswick, Middlesex County, New Jersey. Over 1.2 million square feet of space are designated to manufacturing and distribution of home and hospital health care products such as adhesive bandages (Band-Aid®), surgical dressings, hemostats (Surgicel®), back plasters, orthopedic dressings, surgical tapes and other professional and medical products. The plant normally operates primarily as a single shift, 5 day workweek although this may be extended when product demand warrants. Operations began in 1961 and currently employ approximately 800 to 1000 employees of which 600 are wage and 400 are salary.

A typical operation involves application of an adhesive onto basic backing material. This production consists of conveying liquid adhesive onto backing material by a solvent spreader. This material is slit into rolls which are combined with absorbant pads. It is then packaged and sterilized in an oven. Ethylene oxide is used to sterilize the material before shipment. This operation generates waste ignitable polymeric adhesive residues with xylene and/or methyethyl ketone and methyl isobutyl ketone from the flashing of the adhesive and cleaning of application equipment. In addition waste tricresyl phosphate is generated during maintenance of heat unit which operates as air scrubber for solvent spreading operation. Waste oil, some containing polychlorinated biphenols, is generated during maintenance of various equipment onsite.

All wastes are now stored in a hazardous waste drum storage "building" which is equipped with complete spill and fire protection.

Describe the activities that result in the generation of hazardous waste.

- D001 Ignitable polymeric adhesive residues with xylene and/or methylethyl ketone (MEK), methyl isobutyl ketone (MIBK) Generated during 'flushing' of adhesives and cleaning of equipment. MEK and MIBK encoded with ink printing
- D002 Aqueous Corrosive liquid. Generated during treatment of wastes (prevent scale) and cleaning.
- D008 Waste Hydroxide Rinsate ("primer waste") containing 5ppm of lead + greater. Generated as interior liner waste. Virgin product includes casein which causes shelf life to 3 days and bentonite clay which may cause thickening or when not is mixed. Currently waste stream is tested and only drummed if lead is present. Otherwise waste is discharged to sanitary sewer via Middlesex County Utilities Authority at rate less than 12.5 gallons per minute (less than 1500 gallons per day) - see attached permission letter
- F002 Spent Halogenated Degreaser liquid containing 1,1,1 trichloroethane (TCE) and 1,1,1 Trichlorotrifluoroethane (FREON). TCE generated as degreaser from equipment cleanup. Freon generated during production of hemostat ("swabs")
- F003 Ignitable - Spent non-halogenated solvents containing xylene, methylethyl ketone (MEK) methylisobutyl ketone Generated during 'flushing' of adhesives and cleaning of equipment.
- X726 Waste Oil (cutting, lubrication, quenching) Generated from equipment maintenance and cleanup of oil spills. May include absorbent booms used along parking lot and speedway.
- X900 & X910 Off specification products - waste consumer commodity.
- X940 Waste Tricresyl phosphate (Waste Flamable Liquid). Generated during maintenance of "heat unit" which is part of air scrubber system for solvent spreading area.
- C387 Hazardous Waste Solid NOS - polychlorinated biphenyls NOS - solid debris (gloves & absorbants) and liquid from maintenance of equipment.
- U~~ Various small quantities of various chemicals drummed as lab packs. Generated from Quality Assurance / Quality Control Testing laboratory.

Identify the hazardous waste located on site, and estimate the approximate quantities of each.
(Identify Waste Codes)

D001 / F003 Ignitable - Polymeric Adhesive Residues with xylene and/or methylethyl Ketone (MEK), methylisobutyl ketone (MIBK). Waste code is determined by testing laboratory / disposal company prior to shipment. 64 - 55 gallon steel drums stored in hazardous waste drum storage "building".

D008 Waste Hydroxide Rinsate ("primer waste") possibly containing 5ppm or greater of lead. This material has solidified and will be sent out for incineration. 148 - 55gallon steel drums stored in hazardous waste drum storage "building"

X726 Waste Oil (cutting, quenching, lubrication). 9 - 55 gallon steel drums containing solid material (rags) stored in hazardous waste drum storage "building" along with 3 - 55 gallon steel drums of liquid.

X940 Waste Tricresyl Phosphate (Waste Flamable Liquid) 18 - 55 gallon steel drums stored in hazardous waste drum storage "building"

C387 Hazardous Waste Solid NOS - polychlorinated biphenyls NOS 5 - 55 gallon steel drums containing residues along with 9 - 55 gallon drums of solid material (gloves, rags, absorbants) stored in hazardous waste drum storage "building"

HAZARDOUS WASTE FACILITY STANDARDS

MANIFESTS

		YES	NO	N/A
7:26-7.4(a)4	Does each manifest have the following information? Please circle the elements missing and obtain a copy of the incomplete manifests. (List those manifests that are deficient on G-1).	✓	—	—
7:26-7.4(a)4i	The generator's name, address and phone number.	✓	—	—
7:26-7.4(a)4ii	The generator's EPA ID number.	✓	—	—
7:26-7.4(a)4iii	The hauler(s) name, address phone number and NJ registration.	✓	—	—
7:26-7.4(a)4iv	The hauler(s) EPA ID number.	✓	—	—
7:26-7.4(a)4v	The name, address and phone number of the designated TSD facility.	✓	—	—
7:26-7.4(a)4vi	The TSF's EPA ID number.	✓	—	—
7:26-7.4(a)4v	The name, address and phone number of the designated TSD facility.	✓	—	—
7:26-7.4(a)4vii	The name, type and quantity of hazardous waste being shipped, including such particulars as may be required regarding same? Manifest# NSA 0297347 - previously cited NOV - no since corrected	✓	N/A	—
→ 7:26-7.4(a)4viii	Special handling instructions and any other information required on the form to be shipped by generator? Manifest# SC08304 does not describe NOS	N/A	✓	—

		YES	NO	N/A
7:26-7.4(3)	Did the generator describe all N.O.S. wastes in Section J? See 7:26-7.4(a)5ii.	—	✓	—
7:26-7.4(a)1x	When shipping hazardous waste to a waste reuse facility does the generator enter the waste reuse facility I.D. # in the section G of the Uniform Manifest?	—	—	✓
7:26-7.4(a)5	Before allowing the manifested waste to leave the generator's property, did the generator:	✓	—	—
7:26-7.4(a)5i	Sign the manifest certification by hand?	✓	—	—
7:26-7.4(a)5ii	Obtain the handwritten signature of the initial transporter and date of acceptance on the manifest?	✓	—	—
7:26-7.4(a)5iii	Retain one copy and forward one copy to the state of origin and one copy to the state of destination?	✓	—	—
7:26-7.4(a)5iv	Provide the required numbers of copies for: generator, each hauler, owner/operator of the designated facility, as well as one copy returned to the generator by the facility owner/operator?	✓	—	—
7:26-7.4(a)5v	Give the remaining copies of the manifest form to the hauler?	✓	—	—
7.26-7.4(f)	Has the generator maintained facility records for three (3) years? (Manifest(s), exception report(s) and waste analysis)	✓	—	—
7:26-7.4(h)1	Has the generator received signed copies of portion B (from the TSD facility) of all manifests for waste shipped off site more than 35 days ago?	✓	—	—
7:26-7.4(h)1	If not: Did the generator contact the hauler and/or the owner or operator of the TSDF and the NJDEP at (609) 292-8341 to inform the NJDEP of the situation?	—	—	✓
7:26-7.4(h)2	Have exception reports been submitted to the Department covering any of these shipments made more than 45 days ago?	—	—	✓

		YES	NO	N/A
7:26-9.4(b)	Waste Analysis			
7:26-9.4(b)1i	Is there a detailed chemical and physical analysis of a representative sample of the waste(s) or each waste? (At a minimum, this analysis most contain all the information necessary for proper treatment storage or disposal of the waste). Included in 6/21/93 letter to Ernest Kuhlmann Jr. - Hazardous Waste Engineering Part B-1 Permit Application NJDEP Division	✓		
7:26-9.4(b)1iii	Does the character of the waste handled at the facility change from day to day, week to week, etc., thus requiring frequent testing? Check only one:		✓	
	Waste characteristics vary:			
	All waste(s) are basically the same:	✓		
	Company treats all waste(s) as hazardous:			
7:26-9.4(b)2	Is there a written waste analysis plan at the facility?	✓		
	Does it contain:			
7:26-9.4(2)i	Parameters for which each hazardous waste stream will be analyzed including constituents listed in NJAC 7:26-8.16 and the rational for the selection of these parameters? Included in 6/21/93 letter to Ernest Kuhlmann Jr. - Hazardous Waste Engineering NJDEP Division	✓		
7:26-9.4(b)2ii	The test methods which will be used to test for these parameters?	✓		
7:26-9.4(b)2iii	The sampling method which will be used to obtain a representative sample of the waste to be analyzed?	✓		
7:26-9.4(b)2iv	The frequency with which the initial analysis of the waste will be reviewed or repeated to ensure that the analysis is accurate and up-to-date? Annual analysis by independent lab + if waste streams change	✓		
7:26-9.4(b)2v	For off-site facilities, the waste analysis that hazardous waste generators have agreed to supply?	✓		
7:26-9.4(b)2vii	Procedures which will be used to identify changes in waste stream characteristics?	✓		
	Does hazardous waste come to this facility from an outside source? (e.g., another generator).		✓	
	If yes, list the name(s) of generators.			

		YES	NO	N/A
7:26-9.4(b)4	If waste comes from an outside source, are there procedures in the waste analysis plan to insure that waste received conforms to the accompanying manifest?	—	—	✓
	Does the plan describe:			
7:26-9.4(b)4i	The procedures which will be used to determine the identity of each shipment of waste managed at the facility?	—	—	✓
7:26-9.4(b)4ii	The sampling method which will be used to obtain a representative sample of the waste to be identified, if the identification method includes sampling?	—	—	✓
7:26-9.4(c)1	Did the facility accept hazardous waste which it is not authorized to handle?	—	—	✓
7:26-9.4(i)	Are all records and results of waste analysis performed pursuant to NJAC 7:26-9.4(b) and 9.4(e) as applicable written in the operating log?	—	—	✓
7:7:26-9.4(h)	Security			
	Does the facility have:			
7:26-9.4(h)1i	A 24 hour surveillance system which continuously monitors and controls entry onto the active portion of the facility?	✓	—	—
7:26-9.4(h)1ii	An artificial or natural barrier, which completely surrounds the active portion of the facility; and a means to control entry, at all times, through the gates or other entrances to the active portion of the facility?	✓	—	—
7:26-9.4(h)3	Are there "Danger-Unauthorized Personnel Keep Out" signs posted at each entrance to the facility? at Drum Storage Area	✓	—	—
	If no, explain what measures are taken for security.			

		YES	NO	N/A
7:26-9.4(f)	General Inspection Requirements			
7:26-9.4(f)1	Does the owner or operator inspect the facility for malfunctions and deterioration, operator errors and discharges which may be causing, or may lead to:			
7:26-9.4(f)1i	Discharge of hazardous waste constituents to the environment?	✓	—	—
7:26-9.4(f)1ii	A threat to human health?	✓	—	—
7:26-9.4(f)3	Has the owner or operator developed, and does the owner or operator follow a written schedule for inspecting monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that are utilized for the prevention, detection or response to environmental or human health?	✓	—	—
7:26-9.4(f)3i	Did the owner or operator submit the written inspection schedule to the department?	✓	—	—
	If yes, when was it submitted? Included in Part B submitted on April 11, 1983	✓	—	—
7:26-9.4(f)3iii	Is the written inspection schedule kept at the facility?	✓	—	—
7:26-9.4(f)3iv	Does the schedule identify the types of problems to be looked for during the inspection?	✓	—	—
7:26-9.4(f)3v	Does the schedule include the frequency of inspection, based upon the rate of possible deterioration of the equipment and the probability of an environmental, or human health incident if the deterioration or malfunctions or any operator error goes undetected between inspections? SMPC	✓	—	—
→ 7:26-9.4(f)5	Is there evidence that problems reported in the inspection log have not been remedied? From weeks of 01-30-87 to 05-22-87 a very slight leak on pipe to sprinklers was reported. Leak was temporarily repaired sometime during week of 05-24-87	✓	—	—
7:26-9.4(f)6	Does the owner/operator record inspections in a log?	✓	—	—

		YES	NO	N/A
7:26-9.4(f)6	Are these records kept for at least three (3) years from the date of inspection?	✓		
→ 7:26-9.4(f)6	Does the records include the date, and time of the inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial action? Inspection log does not include time of inspection or date and nature of repairs		✓	
7:26-9.4(g)	Personnel Training			
	Have facility personnel successfully completed a program of classroom instruction or on-the-job training within six months of having been employed?	✓		
7:26-9.4(g)2	Is the program directed by a person trained in hazardous waste management procedures and does it include instruction which teaches facility personnel hazardous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed?	✓		
7:26-9.4(g)5	If yes, have facility personnel taken part in an annual review of training?	✓		
	Is there written documentation of the following:	✓		
7:26-9.4(g)6i	Job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job?	✓		
7:26-9.4(g)6ii	A written job description for each position related to hazardous waste management?	✓		
7:26-9.4(g)6iii	A written description of the type and amount of both introductory and continuing training given to personnel in jobs related to hazardous waste management?	✓		
7:26-9.4(g)6iv	Documentation of actual training or experience received by personnel?	✓		

		YES	NO	N/A
7:26-9.4(g)7	Are training records kept on all current employees until closure of the facility and training records kept on former employees for three years from their last date of employment?	✓		
→ 7:26-9.4(g)8	Are semi-annual drills conducted involving all employees and appropriate local authorities to test emergency response capabilities at the facility in accordance with the contingency plan and emergency procedures development pursuant to NJAC 7:26-9.7? Semi-annual drills involving all employees are conducted. Local fire department calls attend annual drill which may be due to their voluntary status.		✓	
7:26-9.6	**Preparedness and Prevention**			
	Does the facility comply with preparedness and prevention requirements including maintaining:			
7:26-9.6(b)1	An internal communications or alarm system? First Aid + Fire Alarms, Paging System via telephones	✓		
7:26-9.6(b)2	A telephone or other device to summon emergency assistance from local authorities?	✓		
7:26-9.6(b)3	Portable fire equipment, spill control equipment, and decontamination equipment?	✓		
7:26-9.6(b)4	Water at adequate volume and pressure to supply water hose streams, or foam producing equipment, or automatic sprinklers, or water spray systems?	✓		
7:26-9.6(c)	Is equipment tested and maintained?	✓		
7:26-9.6(d)1	Is there immediate access to communications or alarm systems during handling of hazardous waste? telephones fire alarm	✓		
7:26-9.6(e)	Adequate aisle space to allow unobstructed movement of personnel fire protection equipment, spill control equipment and decontamination equipment?		✓	

If no, please explain.

4 Drums are stored on wood pallets which are stacked on shelves three high. Each pallet of drums is protected by sprinkler head. Entire storage area includes smoke detectors. Two 55 gal drums empty waste oil, 1000 gal underground storage tanks. Fork lifts are explosion proof.

		YES	NO	N/A
	In your opinion, do the types of waste on site require all of the above procedures, or are some not required? Explain.	✓	—	—
7:26-9.6(f)	Has the facility made the following arrangements, as appropriate for the type of waste handled on site?	✓	—	—
7:26-9.6(f)1	Familiarize police, fire departments and emergency response teams with the layout of the facility and hazardous waste handled? Submitted copy of Plan in July, 1988.	✓	—	—
7:26-9.6(f)2	Where more than one police and fire department might respond to an emergency, is there an agreement designating primary emergency authority to a specific police or fire department, and agreements with any others to provide support to the primary emergency authority?	—	—	✓
7:26-9.6(f)3	Agreements with emergency response contractors, and equipment suppliers? Yes - OH Materials, AETC, NEPCO	✓	—	—
7:26-9.6(f)4	Arrangements to familiarize local hospitals with the properties of hazardous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or discharges at the facility?	✓	—	—
7:26-9.6(f)5	Arrangements with local fire departments to inspect the facility on a regular basis with at least two inspections annually?	✓	—	—
7:26-9.7	Contingency Plan and Emergency Procedures			
7:26-9.7(a)	Does the facility have a written contingency plan for emergency procedures designed to deal with fires, explosions, hazards to human health or environment, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water?	✓	—	—

		YES	NO	N/A
7:26-9.7(b)	Are provisions of the plan carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment?	✓	—	—
7:26-9.7(c)	Does the contingency plan describe the actions facility personnel shall take in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water at the facility?	✓	—	—
7:26-9.7(d)	Did the owner or operator prepare a Spill Prevention, Control, and Countermeasures (SPCC) Plan in accordance with 40 CFR 112 or 151 or a Discharge Prevention, Containment and Countermeasure (DPCC) Plan in accordance with NJAC 7:1E-4.1 et seq.?	✓	—	—
	If yes, did the owner or operator amend that plan to incorporate hazardous waste management provisions that are sufficient to comply with the requirements of this section?	✓	—	—
7:26-9.7(e)	Does the plan describe arrangements agreed to by local police departments, fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services?	✓	—	—
7:26-9.7(f)	Does the plan list names, addresses, and phone numbers (office and home) of all persons qualified to act as emergency coordinator and is this list kept up-to-date? Where more than one person is listed, one shall be named as primary emergency coordinator and others shall assume responsibility as alternates?	✓	—	—

		YES	NO	N/A
7:26-9.7(g)	Does the plan include a list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external), and decontamination equipment), where this equipment is required? Is the list kept up-to-date? In addition, does the plan include the location and a physical description of each item on the list, and a brief outline of its capabilities? No outline of equipment capabilities	—	✓	—
7:26-9.7(h)	Does the plan include an evacuation procedure for facility personnel where there is a possibility that evacuation could be necessary? Does this plan describe signal(s) to be used to begin evacuation, evacuation routes, and alternative evacuation routes (in cases where the primary routes could be blocked by releases of hazardous waste or fires)?	✓	—	—
7:26-9.7(i)	Is a copy of the contingency plan and all revisions to the plan:			
	1. Maintained at the facility; and	✓	—	—
	2. Has the contingency plan been submitted to local authorities (police, fire departments, emergency response teams)?	✓	—	—
7:26-9.7(k)	Is there at least one employee on site or on call with the responsibility of coordinating all emergency response measures?	✓	—	—
7:26-9.8	Closure Plan			
7:26-9.8(c)	Does the facility have a written closure plan?	✓	—	—
	Does the owner/operator keep a written copy of the closure plan and all revisions to the plan at the facility?	✓	—	—
	If yes, does the plan include:			

		YES	NO	N/A
7:26-9.8(e)1i	A description of how and when the facility will be partially closed (if applicable) and ultimately closed?	✓	—	—
7:26-9.8(e)1ii	The maximum extent of the operation which will be open during the life of the facility?	✓	—	—
7:26-9.8(e)2	An estimate of the maximum inventory of wastes in storage or in treatment at any given time during the life of the facility? 120 days.	✓	—	—
7:26-9.8(e)3	A description of the steps needed to decontamination facility equipment during closure?	✓	—	—
7:26-9.8(e)4	A schedule for final closure including the anticipated date when the wastes will no longer be received, the date when completion of final closure is anticipated, and intervening milestone dates which will allow tracking of the progress of closure?	✓	—	—
	Post Closure Plan			
7:26-9.9(g)	Does the facility have a written post-closure plan kept at the facility?	—	—	✓
	If yes, does the plan:			
7:26-9.9(i)	Identify the activities which will be carried on after closure and the frequency of these activities?	—	—	✓
7:26-9.9(i)1	Include a description of the planned ground water monitoring activities and frequencies at which they will be performed?	—	—	✓
7:26-9.9(i)2	Include a description of the planned maintenance activities, and frequency at which they will be performed, to insure the following:	—	—	✓
7:26-9.9(i)2i	The integrity of the cap and final cover or other containment structures where applicable?	—	—	✓
7:26-9.9(i)2ii	Describe the function of the facility monitoring equipment?	—	—	✓

		YES	NO	N/A
7:26-9.9(1)3	Include the name, address and phone number of a person or office to contact about the disposal facility during the post-closure period?			✓
	Does the owner/operator have a written estimate of the cost of post-closure for the facility?			✓
	If yes, what is it?			

Please circle all appropriate activities and answer questions in appropriate sections all activities circled.

Storage	Treatment	Disposal
(Container) 55 gal. drums	Tank	Landfill
Tank, Above Ground	Surface Impoundments	
Tank, Below Ground	Incineration	Surface Impoundments
Surface Impoundments	Thermal Treatment	Other _____
Waste Piles		
Other _____	Chemical, Physical and Biological Treatment	
Other _____		

7:26-9.4(d) Containers

What type of containers are used for storage? Describe the size, type, quantity and nature of wastes (e.g., 12 fifty-five gallon drums of waste acetone).

7:26-9.4(d)1i	Do the containers appear to be of sturdy leakproof construction of adequate wall thickness, weld, hinge and seam strength, and of sufficient material strength to withstand side and bottom shock, while filled, without impairment of the container's ability to contain hazardous waste?	✓		
	If no, explain.			

		YES	NO	N/A
7:26-9.4(d)1ii	Are the lids, caps, hinges or other closure devices of sufficient strength that when closed, they will withstand dropping, overturning or other shock without impairment of the container's ability to contain hazardous waste?	✓	—	—
	If no, explain.			
7:26-9.4(d)2	Do the containers appear to be in good condition, not in danger of leaking?	✓	—	—
7:26-9.4(d)2	If not, please describe the type, condition and number of leaking or corroded containers. Be detailed and specific.			
7:26-9.4(d)3	Are hazardous wastes stored in containers made of compatible materials?	✓	—	—
7:26-9.4(d)4i	Are all containers securely closed, except those in use, so that there is no escape of hazardous waste or its vapors?	✓	—	—
	If no, explain.			
→ 7:26-9.4(d)4iii	Do containers appear to be properly opened, handled or stored in a manner which will minimize the risk of the container rupturing or leaking? The containers on the shelves on wood pallets. Several of these pallets were partially covered	—	✓	—
	If no, explain.			
7:26-9.4(d)iv	Are containerized hazardous wastes segregated in storage by waste type?	✓	—	—
7:26-9.4(d)v	Are containerized hazardous wastes arranged so that their identification label is visible?	✓	—	—
7:26-9.4(d)5	Does the owner/operator inspect the container storage area at least daily, looking for leaks and for deterioration caused by corrosion or other factors?	✓	—	—
7:26-9.4(d)6	Are containers holding ignitable and reactive waste located at least 50 feet (15 meters) away from the facility's property line?	✓	—	—

		YES	NO	N/A
7:26-9.4(d)7i	Are incompatible wastes, or incompatible wastes and materials placed in the same container?	—	✓	—
	If yes, explain.			
7:26-9.4(d)7ii	Are hazardous wastes placed in unwashed containers that previously held incompatible wastes?	—	✓	—
	If yes, explain.			
7:26-9.4(d)7iii	Are containers holding hazardous waste that are incompatible with any waste or other materials stored nearby in other containers, open tanks, or surface impoundments separated from the other materials or protected from them by means of a dike, berm, wall or other device?	✓	—	—
7:26-9.4(e)1i	Are ignitable, reactive or incompatible wastes protected from sources of ignition or reaction?	✓	—	—
	If no, explain.			
7:26-9.4(e)1ii	Does the owner/operator confine smoking and open flames to specially designated locations when ignitable or reactive wastes are being handled?	✓	—	—
	If no, explain.			
7:26-9.4(e)1iii	Does the owner/operator conspicuously place "No Smoking" signs whenever there is a hazard from ignitable or reactive waste?	✓	—	—
	If the treatment, storage or disposal of ignitable or reactive waste, and the mixture of incompatible wastes and materials, conducted so that it does not:			
7:26-9.4(e)2i	Generate extreme heat or pressure, fire or explosion, or violent reaction?	✓	—	—
7:26-9.4(e)2ii	Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health.	✓	—	—

		YES	NO	N/A
7:26-9.4(e)2iii	Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk or fire or explosion?		✓	
7:26-9.4(e)2iv	Damage the structural integrity of the device or facility containing the waste?		✓	
7:26-9.4(e)2v	Threaten human health or the environment?		✓	
7:26-11.2	Tanks			
	What are the approximate number and size of tanks containing hazardous waste? None			✓
	Identify the waste treated/stored in each tank.			
	General Operating Requirements			
7:26-11.2(a)2	Are hazardous wastes or treatment reagents placed in the tank that could cause the tank or its inner liner to rupture, leak or corrode?			✓
	If yes, please explain.			
	Are there leaking tanks?			✓
7:26-11.2(a)2	Are all hazardous wastes or treatment reagents being placed in tanks compatible with the tank material so that there is no danger or ruptures, corrosion, leaks or other failures?			✓
7:26-11.2(3)	Do uncovered tanks have at least two feet of freeboard or an adequate containment structure?			✓
7:26-11.2(a)4	If waste is continuously fed into a tank, is the tank equipped with a means to stop the inflow from the tank, e.g., bypass system to a standby tank?			✓
7:26-11.2(c)	Inspections			
	Is the tank(s) inspected for:			
	1. Discharge control equipment (each operating day).			✓

		YES	NO	N/A
	2. Monitoring equipment (each operating day).	—	—	✓
	3. Level of waste in tank (each operating day).	—	—	✓
	4. Construction of materials of the tank (weekly).	—	—	✓
	5. Are the tanks and surrounding areas (e.g., dike) inspected weekly for leaks, corrosion or other failures (weekly)?	—	—	✓
7:26-11.2(e)	Are ignitable or reactive wastes stored in a manner which protects them from a source of ignition or reaction?	—	—	✓
	If no, please explain.			
7:26-11.2(f)	Does it appear that incompatible wastes are being stored separate from each other?	—	—	✓
7:26-9.2(b)	Are there underground tanks used to store hazardous waste?	—	—	✓
	If yes, how many and can they be entered for inspection?	—	—	✓
	Has the underground tank been in use on or before November 19, 1980? Specify Date.	—	—	✓
	If no, when was the tank placed in use?			
7:26-9.2(b)3i	Does the facility have a ground water monitoring plan approved by the department?	—	—	✓
7:26-9.2(b)3ii	Is the use of the tank specified to the manufacturers recommended lifetime?	—	—	✓
7:26-11.3	<u>Surface Impoundments</u>			
	Describe the design and operating features of the surface impoundment to prevent ground water contamination (e.g., liner leachate collection system).			
	Give the approximate size of surface impoundments (gallons or cubic feet). Please specify the types of waste stored and treated.			

		YES	NO	N/A
7:26-11.3(a)	Is there at least two feet of freeboard in the impoundment?			✓
7:26-11.3(b)	Do all earthen dikes have a protective cover to preserve their structural integrity?			✓
	If yes, please specify the type of covering.			
7:26-9.4(c)1	Does the owner/operator have a detailed chemical and physical analysis of a representative sample of the waste in the impoundment?			✓
7:26-9.4(i)	Does the owner/operator place the results from each waste analysis and trial test, or the documented information, in the operating record of the facility?			✓
7:26-11.3(d)	Does the owner or operator inspect:			
7:26-11.3(d)1	The freeboard level at least once each operating day to ensure compliance with subsection 11.3(a)?			✓
7:26-11.3(d)2	The surface impoundment, including dikes and vegetation surrounding the dike, at least once a week to detect any leaks, deterioration or failures in the impoundment?			✓
7:26-11.3(f)	Is ignitable or reactive waste placed in the surface impoundment?			✓
7:26-11.3(f)1	If yes, is the waste treated, rendered, or mixed before or immediately after placement in the impoundment?			✓
7:26-11.3(f)1i	Does the resulting waste, mixture, or dissolution of material no longer meet the definition of ignitable or reactive waste?			✓

		YES	NO	N/A
7:26-11.3(f)1ii	Is the waste treated, rendered or mixed so that it does not:			
7:26-9.4(e)2i	Generate extreme heat or pressure, fire or explosion, or violent reaction?	—	—	✓
7:26-9.4(e)2ii	Produce uncontrolled toxic mists, fumes, dusts, of gases in sufficient quantities to threaten human health?	—	—	✓
7:26-9.4(e)2iii	Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion?	—	—	✓
7:26-9.4(e)2iv	Damage the structural integrity of the device or facility containing the waste?	—	—	✓
7:26-9.4(e)2v	Threaten human health or the environment?	—	—	✓
7:26-11.3(f)2	Is the surface impoundment used solely for emergencies?	—	—	✓
7:26-11.3(g)	Are incompatible wastes, or incompatible wastes and materials placed in the same surface impoundment?	—	—	✓
	If yes, is the waste managed so that it does not:			
7:26-9.4(e)2i	Generate extreme heat or pressure, fire or explosion, or violent reaction?	—	—	✓
7:26-9.4(e)2ii	Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health?	—	—	✓
7:26-9.4(e)2iii	Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk or fire or explosion?	—	—	✓
7:26-9.4(e)2iv	Damage the structural integrity of the device or facility containing the waste?	—	—	✓
7:26-9.4(e)2v	Threaten human health or the environment?	—	—	✓
7:26-11.4	Landfills			
	Identify the types of waste and size of the landfill.			
	General Operating Requirements			
7:26-11.4(a)1	Is run-on diverted away from all portions of the landfill?	—	—	✓

		YES	NO	N/A
7:26-11.4(a)2	Is runoff from active portions of the landfill collected?			✓
7:26-11.4(a)3	Is waste which is subject to wind dispersal controlled?			✓
	Please explain how.			
7:26-11.4(a)4	Does waste disposal or the disposal operation occur within 200 feet (60.6 meters) of the property boundary?			✓
7:26-11.4(a)6	Are untreated, ignitable, or reactive wastes placed in the landfill?			✓
	If yes, explain.			
7:26-11.4(a)7	Are incompatible wastes, or incompatible wastes and materials placed in the same hazardous waste landfill cell?			✓
	If yes, explain.			
7:26-11.4(a)8	Are bulk or non-containerized liquid waste or waste containing free liquids placed in a hazardous waste landfill?			✓
	If yes:			
7:26-11.4(a)8i	Does the hazardous waste landfill have a liner which is chemically and physically resistant to the added liquid and a functioning leachate collection and removal system with a capacity sufficient to remove all leachate produced?			✓
7:26-11.4(a)8ii	Before disposal, is the liquid waste or waste containing free liquids treated or stabilized, chemically or physically, so that free liquids are no longer present?			✓
7:26-11.4(a)9	Are containers holding liquid waste or waste containing free liquids placed in a hazardous waste landfill?			✓
	If yes:			
7:26-11.4(a)9i	Is the container designed to hold liquids or free liquids for a use other than storage, such as a battery?			✓

		YES	NO	N/A
7:26-11.4(a)9ii	Is the container very small, such as an ampule?			✓
7:26-11.4(a)10	Are empty containers crushed flat, shredded, or similarly reduced in volume before it is buried beneath the surface of a hazardous waste landfill?			✓
7:26-11.4(a)11	Does the owner or operator of a hazardous waste landfill continue to dispose of hazardous wastes subsequent to the detection of any liquid, in the secondary collection system?			✓
7:26-11.4(b)	Does the owner or operator of a hazardous waste landfill maintain an operating record required in NJAC 7:26-9.4(i)?			✓
7:26-11.4(b)1	Does the owner/operator maintain a map, the exact location and dimensions, including depth of each cell with respect to permanently surveyed bench marks?			✓
7:26-11.4(b)2	The contents of each cell and the appropriate location of each hazardous waste type within each cell?			✓
	Are containers holding liquid waste or waste containing free liquids placed in the landfill?			✓
	Please describe the types and contents of such containers placed in the landfill.			
	Are empty containers placed in the landfill crushed flat, shredded or similarly reduced in volume before they are buried?			✓
	Are small containers of hazardous waste in overpacked drums placed in the landfill?			✓
	If yes, please describe precautions taken to prevent the release of the waste.			
7:26-11.5	Incinerator			
	What type of incinerator is at the site (e.g., waterwall incinerator, boiler, fluidized bed, etc.).			

		YES	NO	N/A
	Is the residue from the incinerator a hazardous waste?			✓
	What types of air pollution control devices (if any) are installed in the incinerator unit?			
	Is energy recovered from the process?			✓
	If yes, describe.			
	What is the destruction and removal efficiency for the organic hazardous waste constituents?			
7:26-11.5(b)1	Does the operating record include additional analysis and to determine types of pollutants which might be emitted including:			
7:26-11.5(b)1i	Heating value of the waste?			✓
7:26-11.5(b)1ii	Halogen and sulfur content?			✓
7:26-11.5(b)1iii	Concentrations of lead and mercury?			✓
7:26-11.5(2)	If no to any of the above questions, is there justification and documentation?			✓
	If operating, does it appear the incinerator is operating at steady state for conditions of operation, including temperature and air flow?			✓
	<u>Monitoring and Inspection</u>			
7:26-11.5(c)1	Are existing instruments relating to combustion and emission controls monitored every 15 minutes?			✓
	If no, explain.			
7:26-11.5(c)1	Does the incinerator have all the following instruments for measuring: Wastefeed, auxiliary fuel feed air flow, incinerator temperature scrubber flow, and scrubber pH? (Circle Missing Instruments).			✓
	If no, explain.			
7:26-11.5(c)2	Is the stack plume observed visually at least hourly for opacity and color?			✓

		YES	NO	N/A
7:26-11.5(c)3	Are there any signs of leaks, spill and fugitive emission associated with the pumps, valves, conveyors, pipes, etc.?	—	—	✓
	If yes, describe.			
7:26-11.5(c)3	Are all emergency shutdown controls and system alarms checked to assure proper operation?	—	—	✓
	Is there any reason to believe the incinerator is being operated improperly? i.e., steady state conditions are not maintained.	—	—	✓
	If yes, explain.			
7:26-11.5(c)3	Is the incinerator inspected daily?	—	—	✓
7:26-11.6	Thermal Treatment			
	What type of thermal treatment is at the site (e.g., waterwall incinerator, boiler, fluidized bed, etc.).			
	List the types and quantities of hazardous waste thermally treated.			
	Is the residue from the thermal treatment unit a hazardous waste?	—	—	✓
	What types of air pollution control devices (if any) are installed in the thermal treatment unit?			
	Is energy recovered from the process?	—	—	✓
	If yes, describe.			
	What is the destruction and removal efficiency for the organic hazardous waste constituents?			
7:26-11.6(b)1	Does the operating record include additional analysis and to determine types of pollutants which might be emitted including:			
7:26-11.6(b)1i	Heating value of the waste?	—	—	✓
7:26-11.6(b)1ii	Halogen and sulfur content?	—	—	✓
7:26-11.6(b)1iii	Concentrations of lead and mercury?	—	—	✓

		YES	NO	N/A
7:26-11.6(2)	If no to any of the above questions, is there justification and documentation?	—	—	✓
	If operating, does it appear the thermal treatment unit is operating at steady state for conditions of operation, including temperature and air flow?	—	—	✓
	Monitoring and Inspection			
	Are existing instruments relating to combustion and emission controls monitored every 15 minutes?	—	—	✓
	If no, explain.			
7:26-11.6(c)1	Does the thermal treatment have all the following instruments for measuring: Wastefeed, auxiliary fuel feed air flow, incinerator temperature scrubber flow, and scrubber pH? (Circle Missing Instruments).	—	—	✓
	If no, explain.			
7:26-11.6(c)2	Is the stack plume observed visually at least hourly for opacity and color?	—	—	✓
7:26-11.6(c)3	Are there any signs of leaks, spills and fugitive emission associated with the pumps, valves, conveyors, pipes, etc?	—	—	✓
	If yes, describe.			
7:26-11.6(c)3	Are all emergency shutdown controls and system alarms checked to assure proper operation?	—	—	✓
	Is there any reason to believe the thermal treatment unit is being operated improperly? i.e., steady state conditions are not maintained.	—	—	✓
	If yes, explain.			
7:26-11.6(c)3	Is the thermal treatment inspected daily?	—	—	✓
7:26-11.6(e)	Is there open burning of hazardous waste?	—	—	✓
	If yes, what is being burned? (Only burning or detonation of explosives is permitted).			

		YES	NO	N/A
	If open burning or detonation of explosives is taking place, approximately what is the distance from the open burning or detonation to the property of others?			
7:26-11.7	Chemical, Physical and Biological Treatment (Other than in tanks, surface impoundments or plant treatment facilities). Describe the treatment system at this facility and the types of wastes treated.			
7:26-11.7(a)2	Does the treatment process system show any signs or ruptures, leaks or corrosion? If yes, describe.	—	—	✓
7:26-11.7(a)3	Is there a means to stop the inflow of continuously fed hazardous wastes?	—	—	✓
	Inspections			
7:26-11.7(c)1	Is the discharge control safety equipment (e.g., waste feed cut-off systems, bypass systems, drainage systems and pressure relief systems) in good working order?	—	—	✓
7:26-11.7(c)1	Are they inspected at least once each operation day?	—	—	✓
7:26-11.7(c)2	Does the data gathered from the monitoring equipment (e.g., pressure and temperature gauges) show treatment process is operating according to design?	—	—	✓
7:26-11.7(c)2	Is data gathered at least once each operating day?	—	—	✓
7:26-11.7(c)3	Are construction materials of the treatment process inspected at least weekly to detect corrosion or leaking of fixtures and seams?	—	—	✓
7:26-11.7(c)4	Are the discharge confinement structures (e.g., dikes) immediately surrounding the treatment unit inspected at least weekly to detect erosion or obvious signs of leakage (e.g., wet spots or dead vegetation).	—	—	✓

		YES	NO	N/A
7:26-11.7(e)1	Are ignitable or reactive waste fed into the waste treatment system treated or protected from any material or conditions which may cause it to ignite or react?			✓
	If yes, explain how.			
7:26-11.7(f)	Are the incompatible wastes placed in the same treatment process?			✓
	If yes, please explain.			
7:14A-6	Ground Water Monitoring			
	(Applies only to: Surface impoundments, landfills, land disposal facilities).			
7:14A-6.2	Does the owner/operator have a ground water monitoring plan approved by the department and capable of determining the facility's impact on the quality of ground water?			✓
	If no, please explain.			
	How many monitoring wells has the facility installed?			
	What is the depth to ground water?			
	How many deep monitoring wells are on site? (Indicate depth of monitoring wells).			
	How many shallow monitoring wells are on site? (Indicate depth of monitoring wells).			
7:14A-6.3(a)	Is the ground water monitoring system capable of yielding ground water samples for analysis?			✓
	If no, please explain.			
7:14A-6.3(a)1	Are monitoring wells installed hydraulically upgradient?			✓
	If yes, specify how many and the depth of each.			

		YES	NO	N/A
7:14A-6.3(a)2	How many monitoring wells are installed hydraulically downgradient?	—	—	✓
	If yes, specify how many and the depth of each.			
7:14A-6.4(a)	Does the owner/operator have a ground water sampling and analysis plan?	—	—	✓
	If no, please explain.			
7:14A-6.4(a)	Does the plan include procedures and techniques for:			
	1. Sample Collection	—	—	✓
	2. Sample Preservation and Shipment	—	—	✓
	3. Analytical Procedures	—	—	—
	4. Chain of Custody	—	—	✓
		—	—	✓
	List the types and quantities of hazardous waste incinerated.			
7:26-9.4(b)3	Did the owner or operator submit the waste analysis plan to the Department?	—	—	✓
	If yes, when was the plan submitted?			

CONFIDENTIAL - RECOMMENDATIONS

TO: Linda Z. Jordan

FROM: Michael P. Gaye DATE: October 11, 1988

SUBJECT: J.J. - Eastern Surgical Dressings Plant

The facility is now utilizing a hazardous waste drum storage building which was approved by Hazardous Waste Engineering and has been included in the permit application (Part A) and closure plan.

The building is accessed from the main building through a folding steel security doors. Beyond this door is a corridor which contains spill and fire control equipment and communication equipment. At the end of the corridor is a fire door with a manual or fusible link automatically activated. The actual storage building includes storage for a maximum of 300 drums. These drums are stored on wood pallettes (4 drums/pallet) which are loaded onto steel shelves which are three high. Drums can be accessed by an explosion proof forklift. The floor of the storage building is fitted with two floor drains which empty into a 10,000 gallon emergency storage tank. Each pallet of drums is protected by an individual sprinkler head.

The identification of the drums is accomplished by hazardous waste labels and an internal tracking system. The drums on the third shelf and in the rear were not easily readable could be accessed by forklift.

I noted several of the wood pallettes used for drum storage were cracked and possibly in risk of collapse. This was cited under NJAC 7:26-9.4(d)4iii (A container holding hazardous waste shall not be handled, opened or stored in a manner which may rupture the container or cause it to leak)

Form DWM-002 B
2/84

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT - CF
~~120 ROUTE 156, YARDVILLE, N.J. 08620~~
Twin Rivers Professional Building
East Windsor, New Jersey 08520

NOTICE OF VIOLATION

ID NO. NJD 000631937 DATE September 22, 1988

NAME OF FACILITY Johnson + Johnson Health Care - Eastern Surgical Dressing Plant

LOCATION OF FACILITY U.S. Route 1 North + Aaron Road North Brunswick, New Jersey

NAME OF OPERATOR John R. Kenyon John R. Kenyon

You are hereby NOTIFIED that during my inspection of your facility on the above date, the following violation(s) of the Solid Waste Management Act, (N.J.S.A. 13:1E-1 et seq.) and Regulations (N.J.A.C. 7:26-1 et seq.) promulgated thereunder and/or the Spill Compensation and Control Act, (N.J.S.A. 58:10-23.11 et seq.) and Regulations (N.J.A.C. 7:1E-1 et seq.) promulgated thereunder were observed. These violation(s) have been recorded as part of the permanent enforcement history of your facility.

DESCRIPTION OF VIOLATION

NJAC 7:26-9.4(g)3 Semi-annual drills involving all employees and appropriate local authorities shall be conducted to test emergency response capabilities at the facility in accordance with the contingency procedures development pursuant to N.J.A.C. 7:26-9.7.

N.J.A.C. 7:26-9.4(b)4.iii A container holding hazardous waste shall not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

Remedial action to correct these violations must be initiated immediately and be completed ~~by~~ _____. Within fifteen (15) days of receipt of this Notice of Violation, you shall submit in writing, to the investigator issuing this notice at the above address, the corrective measures you have taken to attain compliance. The issuance of this document serves as notice to you that a violation has occurred and does not preclude the State of New Jersey, or any of its agencies from initiating further administrative or legal action, or from assessing penalties, with respect to this or other violations. Violations of these regulations are punishable by penalties of $25,000 per violation.

Michael P. Doge
Investigator, Division of Waste Management
Department of Environmental Protection
(609) 426-0700

orm DWM-002 B
/84

NEW SEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
~~120 ROUTE 156, YARDVILLE, N.J. 08620~~
Twin Rivers Professional Building
East Windsor, New Jersey 08520

NOTICE OF VIOLATION

ID NO. NJD 000631937 DATE September 22, 1988

NAME OF FACILITY Johnson + Johnson Health Care - Eastern Surgical Dressing Plant

LOCATION OF FACILITY U.S. Route 1 North + Aaron Road, North Brunswick, New Jersey

NAME OF OPERATOR John R. Kenyon John R. Kenyon

You are hereby NOTIFIED that during my inspection of your facility on the above date, the following violation(s) of the Solid Waste Management Act, (N.J.S.A. 13:1E-1 et seq.) and Regulations (N.J.A.C. 7:26-1 et seq.) promulgated thereunder and/or the Spill Compensation and Control Act, (N.J.S.A. 58:10-23.11 et seq.) and Regulations (N.J.A.C. 7:1E-1 et seq.) promulgated thereunder were observed. These violation(s) have been recorded as part of the permanent enforcement history of your facility.

DESCRIPTION OF VIOLATION

N.J.A.C. 7:26-7.4(a)4 viii A generator must provide on a manifest form special handling instructions and any other information required on the form to be supplied by the generator

Remedial action to correct these violations must be initiated immediately and be completed ~~by~~ _____. Within fifteen (15) days of receipt of this Notice of Violation, you shall submit in writing, to the investigator issuing this notice at the above address, the corrective measures you have taken to attain compliance. The issuance of this document serves as notice to you that a violation has occurred and does not preclude the State of New Jersey, or any of its agencies from initiating further administrative or legal action, or from assessing penalties, with respect to this or other violations. Violations of these regulations are punishable by penalties of $25,000 per violation.

Michael P Gage
Investigator, Division of Waste Management
Department of Environmental Protection
(609) 426-0700

Form DWM-002 B
2/84

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT - CF
~~120 ROUTE 156, YARDVILLE, N.J. 08620~~
Twin Rivers Professional Building
East Windsor New Jersey 08520

NOTICE OF VIOLATION

ID NO. NJD 000631937 DATE September 22, 1988

NAME OF FACILITY Johnson + Johnson Health Care - Eastern Surgical Dressing Plant

LOCATION OF FACILITY U.S. Route 1 North + Aaron Road, North Brunswick, New Jersey

NAME OF OPERATOR John R. Kenyon John R Kenyon

You are hereby NOTIFIED that during my inspection of your facility on the above date, the following violation(s) of the Solid Waste Management Act, (N.J.S.A. 13:1E-1 et seq.) and Regulations (N.J.A.C. 7:26-1 et seq.) promulgated thereunder and/or the Spill Compensation and Control Act, (N.J.S.A. 58:10-23.11 et seq.) and Regulations (N.J.A.C. 7:1E-1 et seq.) promulgated thereunder were observed. These violation(s) have been recorded as part of the permanent enforcement history of your facility.

DESCRIPTION OF VIOLATION

N.J.A.C. 7:26-9.4(f)5 The owner or operator shall remedy any deterioration or malfunction of equipment or structures which the inspection reveals.

N.J.A.C. 7:26-9.4(f)6 The owner or operator shall record inspections in an inspection log or summary which must include the date and time of inspection, the name of the inspector, a notation of observations made, and the date and nature of any repairs or other remedial actions.

Remedial action to correct these violations must be initiated immediately and be completed ~~by~~ _____. Within fifteen (15) days of receipt of this Notice of Violation, you shall submit in writing, to the investigator issuing this notice at the above address, the corrective measures you have taken to attain compliance. The issuance of this document serves as notice to you that a violation has occurred and does not preclude the State of New Jersey, or any of its agencies from initiating further administrative or legal action, or from assessing penalties, with respect to this or other violations. Violations of these regulations are punishable by penalties of $25,000 per violation.

Michael P. Sage
Investigator, Division of Waste Management
Department of Environmental Protection
(609) 426-0700

REFERENCE NO. 6

Facility Name: East Coast Surgical
ID Number: NJD000631937
Inspector: Javier Isaacs
Date: 9/23/97

DRAFT
RCRA F-SOLVENT LAND RESTRICTION
TREATMENT, STORAGE, AND DISPOSAL REQUIREMENTS CHECKLIST

I. FACILITY IDENTIFICATION

East Coast Surgical — A. Facility Name
Rt. 1 & Adams Rd — B. Street (or other identifier)
North Brunswick — C. City
N.J. — D. State
08902 — E. Zip Code
Middlesex — F. County Name
Manufacture of Bandages and Surgical Dressings — G. Nature of business; identification of operations
NJD 000631937 — H. EPA ID #
J.D. Herring (201) 422-5469 — I. Facility Contact (Name and Phone Number)

II.A. For onsite facilities, complete the generator checklist — Comments

B. General Facility Standards

1. Was waste analysis plan revised to cover Part 268 requirements [264.13 or 265.13]?
___Yes X No

2. Did facility obtain representative chemical and physical analysis of wastes and residues [264.13(a)/265.13(a)]?
X Yes ___No

a. Did testing include analyses for all F001-F005 constituents? X Yes ___No

b. Were analyses performed using TCLP? ___Yes X No

c. Were analyses conducted onsite or offsite (identify offsite lab)? X On X Off:
Spectrum Labs

d. Describe frequency of sampling OFF SITE 2/Year
ONSITE Some sampling on Each Container

e. Describe procedures used to identify manifest discrepancies IN house verification done by testing material

3. Are the operating records, including analyses and quantities, complete [264.73/265.73]? X Yes ___No
IN house analysis spot checking.

Facility Name: East Coast Sanitation
ID Number: NJD 002 631 931
Inspector: Taylor / Stracke
Date: 9/23/87

C. Storage [268.50]

Comments

1. a. Were restricted wastes exceeding treatment standards stored? X Yes ___ No

If no, go to "D."

b. Are all containers clearly marked to identify content and date(s) entering storage? X Yes ___ No
Drums identified with pull-in date

c. Do operating records track the location, quantity and dates that waste exceeding treatment standards entered and were removed from storage? X Yes ___ No

d. Do operating records agree with container labeling? X Yes ___ No

e. Is waste exceeding treatment standards stored for less than 1 year? X Yes ___ No

If yes, can you show that such accumulation is not necessary to facilitate proper recovery, treatment, or disposal? ___ Yes ___ No ?

If yes, state how _____

f. Were tanks emptied at least once per year, and do operating records show that volume of waste removed from tanks annually at least equals tank volume? ___ Yes ___ No N/A

g. Was/is waste exceeding treatment standards stored for more than one year? ___ Yes X No

If yes, state the owner/operator's proof that such storage was solely for the purposes of accumulation of such quantities of hazardous waste as are necessary to facilitate proper recovery, treatment, or disposal: _____

_____

h. Are F-solvent wastes exceeding treatment standards "stored" in surface impoundments? ___ Yes X No

D. Treatment in Surface Impoundments [268.4]

1. Were F001-F005 wastes exceeding treatment standards placed in surface impoundments for treatment? ___ Yes X No

If no, go to E.

[redacted] LOG (Refer to CME Instructions) p.1 of

1. EPA ID: NJD000631937

2. HANDLER NAME: Eastern Surgical Dressings

3. ADDRESS: US Rt 1 + Aaron Rd, North Brunswick

4. ENTRY TYPE: New [√] Update [ ]

4A. FULL NAME OF EVALUATION CONTACT PERSON: (PRINT CLEARLY) Peter Taylor Phone: 609 416-0700

5. DATE OF INITIAL EVALUATION WHICH IS THE BASIS FOR THIS REPORT: 9/23/87

5A. AGENCY RESPONSIBLE FOR EVALUATION: [S] (Select a code. Enter code in box.)
E = EPA
X = EPA Oversight
C = Contractor/EPA
S = State
B = Contractor/State
J = Joint
O = Other

6. KIND OF EVALUATION COVERED BY THIS REPORT: [1] (Choose one of the codes listed. Enter code in box.)
1 = Compliance Evaluation Inspection
2 = Sampling Inspection
3 = Record Review
4 = Ground Water Monitoring Evaluation
5 = Follow Up Evaluation
6 = Other - Citizen Complaint (Inspec.)
7 = Other - Part B Call-In (Inspection)
8 = Other - Withdrawal Candidate (Inspec.)
9 = Other - Closed Facility (Inspection)
10 = Other - General (Inspection)
11 = Case Development Inspection

6A. EVALUATION CATEGORY: [3] (Enter code in box. See reverse side for choice of codes.)

7. DATE OF SUBSEQUENT EVALUATION: __/__/__ (Do NOT fill in this item unless you are reporting a subsequent evaluation. The date of the initial evaluation MUST be reported in Item 5.)

8. AREA OF EVALUATION AND CLASS OF VIOLATION:
Enter in the appropriate box:
"X" if a violation is found.
"O" if no violations are found.
"Z" if the area evaluated is still under review.
"R" (used in the "GWM/Rel" box only) if a release is found.
"B" if both a release and violation are found ("GWM/Rel" box only).

AREA OF EVALUATION (Enter an X, O, Z, R, or B in each Area which was evaluated)

CLASS OF VIOLATION	GWM/Rel	Clo/PC	Fin Resp	Part B	Compl Schd	Manifest	Other	LS
I						O	O	O
II						O	O	O

9. ENFORCEMENT ACTIONS:

Class of Vio	Area of Vio	Action Type (Use code)	Date Action Taken	Compliance Dates Scheduled	Compliance Dates Verified	Penalty Assessed	Penalty Collected	Resp Agen (Use code)	Enf. Contact Person (Full Name)

Codes for Type of Enforcement Action:
01 = Interim Status Compliance Letter
02 = §3007 Info. Request
03 = Warning Letter/NOV
04 = §3008(a) Complaint
05 = §3008(a) Final Order
06 = §3013 Order (Initial)
07 = §3013 Order (Final)
08 = §7003 Admin. Order
10 = Informal Action
11 = Civil Action (by DOJ)
12 = Filed Criminal Action
13 = NOV (From EPA to State)
14 = NOV (From State to EPA)
15 = §3008(h) Complaint
16 = §3008(h) Final Order
17 = CERCLA §106 Admin. Order
18 = Civil Referral (to AG/DOJ)
19 = Final Judicial Order
20 = CERCLA §104 Fund Activity

Codes for Responsible Agency:
E = EPA
X = EPA Oversight
S = State

9A. STATUS OF ENFORCEMENT ACTION: [ ] ACTIVE [ ] VIOLATING [ ] RESOLVED [ ] RESCINDED [ ] PROGRESSED STATUS DATE: __/__/__
(Place an "X" in front of the current status of the enforcement action. See reverse side for status definitions.)

10. COMPLIANCE SCHEDULE MILESTONES (See reverse side.)

11. COMMENTS:

(Limit each comment to 80 characters. Up to 99 comments possible. Use reverse side of page, if necessary.)

Inspector: Taylor / [illegible]
Address: CFU Twin Rivers
Profess. Building, E. Windsor
Telephone No: 426-6700

DRAFT
RCRA LAND RESTRICTION F-SOLVENT GENERATOR CHECKLIST

I. HANDLER IDENTIFICATION

Eastern Surgical Dressing — USRT#1 + Harvard
A. Handler Name — B. Street (or other identifier)

North Brunswick — N.J. — 08902 — Middlesex
C. City — D. State — E. Zip Code — F. County Name

manufacture Bandages + Surgical Dressings
G. Nature of Business; Identification of Operations

NJD000631937
H. EPA ID #

James D. Herring — (201) 422-5469
I. Handler Contact (Name and Phone Number)

II. GENERATOR COMPLIANCE

A. F-Solvent Identification

1. Does the handler generate the following wastes?

a. F001 — ✓ Yes — ✗ No
b. F002 — mistakenly marked wrong box — Yes — ✓ No
c. F003 — ✓ Yes — No

If an F003 wastestream listed solely for ignitability has been mixed with a non-restricted solid or hazardous waste, does the resultant mixture exhibit the ignitability characteristic? — ✓ Yes — ✗ No — Xylene contaminated rags

d. F004 — Yes — ✓ No
e. F005 — mistakenly marked wrong box — ✓ Yes — ✗ No

2. Source of the above: Form 8700-12 ___; Part A ___; Part B ___; other (specify) ✓ Knowledge of materials

Appendix A is intended to assist the inspector and enforcement official in determining whether the facility is generating F-solvent wastes, if such wastes were not identified by the facility previously. If you are concerned that F-solvent wastes may be misclassified or mislabeled, turn to Appendix A. Note concerns below: _____

Handler Name: East Sim Sunjica
ID Number: NJD000631937
Inspector: Taylor / Stacel
Date: 9/23

B. BDAT Treatability Group - Treatment Standards Identification — Comments

1. Did the generator correctly determine the appropriate treatability group [268.41] of the waste (Wastewaters containing solvents, pharmaceutical wastewaters containing spent methylene chloride, all other spent solvent wastes)? JSD sends you Notification form — Not available — N — ___Yes ___No

C. Waste Analysis

1. Did the generator determine whether the waste exceeds treatment standards based on [268.7(a)]:

   a. Knowledge of wastes — ~~___~~Yes X No

   b. TCLP — ___Yes X No

   c. Other (specify) analysis on site of each waste stream

   If knowledge, note how this is adequate:

   _____

   If determined by TCLP, provide date of last test, frequency of testing, and attach test results.

   Dates/frequency: N/A

   Note any problems: _____

   d. Were wastes tested using TCLP when a process or wastestream changed? ___Yes X No

2. Did the F-solvent wastes exceed applicable treatability group treatment standards upon generation [268.7(a)(2)]? X Yes ___No ___Some

3. Did the generator dilute the waste or the treatment residual so as to substitute for adequate treatment [268.3] ___Yes X No

D. Management

1. Onsite management

   a. Were F-solvent wastes managed onsite? X Yes ___No

If yes, answer 1(b) and (c); if no, answer 2.

Handler Name: East Coast Sanitation
ID Number: NJD063 1937
Inspector: Taylor Isaacs
Date: 9/23

b. For wastes that exceed treatment standards, was treatment, storage, and/or disposal conducted?
X Yes ___ No

Comments

On site distillation
Disposal of waste

If yes, TSDF Checklist must be completed.

c. Are test results maintained in the operating record [264.74(b)3/265.73(b)(3)]?
___ Yes X No

waste ~~stream~~ system New, not completion line
Not enough waste accumulated for shipment

2. Offsite Management

a. If F-solvent wastes exceed treatment standards, did generator provide treatment facility [268.7(a)(1)]:

Nothing has been shipped off site yet

(i) EPA waste number? ___ Yes ___ No

(ii) Applicable treatment standard? ___ Yes ___ No

(iii) Manifest number? ___ Yes ___ No

(iv) Waste analysis data, if available? ___ Yes ___ No

Identify offsite treatment facilities _____

b. If F-solvent wastes did not exceed treatment standards, did generator provide the disposal facility [268.7(a)(2)]:

(i) EPA Hazardous waste number? ___ Yes ___ No

(ii) Applicable treatment standard? ___ Yes ___ No

(iii) Manifest number? ___ Yes ___ No

(iv) Waste analysis data, if available? ___ Yes ___ No

(v) Certification that waste meets treatment standards? ___ Yes ___ No

Identify land disposal facilities receiving the BDAT certified wastes _____

Handler Name: East Coast Surgical
ID Number: NJD000631931
Inspector: Taylor/Skaal
Date: 9/23/87

c. If waste is subject to nationwide variance [268.30] (e.g., solvent-water mixtures less than 1%), case-by-case extension [268.5] or petition [268.6] does generator provide notice to disposer that waste is exempt from land disposal restrictions [268.7(a)(3)]?
___Yes ___No

Comments

N/A

E. Storage of F-Solvent Waste

1. Was F-solvent waste stored for greater than 90 days (after variance 180/270 days for SQG) [268.50(a)(1)]?
X Yes ___No

If yes, was facility operating as a TSD under interim status or final permit?
X Yes ___~~No~~

If yes, TSDF Checklist must be completed.

F. Treatment Using RCRA 264/265 Exempt Units or Processes (i.e., boilers, furnaces, distillation units, wastewater treatment tanks, etc.)

1. Were treatment residuals generated from RCRA 264/265 exempt units or processes?
X Yes ___No

If yes, list type of treatment unit and processes
distillation - recycling

products manufacture
RX 35

If the residuals from a RCRA-exempt treatment unit are above the treatment standards, the owner/operator is considered a generator of restricted waste. The inspector should determine whether the generator requirements, particularly waste identification requirements, have been met for the treatment residuals.

Handler Name: East Coast Sanding
ID Number: NJD002613933
Inspector: Taylor/Stacy
Date: 9/23/93

APPENDIX A

SOLVENT IDENTIFICATION CHECKLIST

Comments

1. Does the handler generate any of the following F001 constituents (i.e., spent halogenated solvents used in degreasing) as a result of being used in the process either in pure form or commercial grade?

tetrachloroethylene	___ Yes	_|_ No
trichloroethylene	___ Yes	_|_ No
methylene chloride	___ Yes	_|_ No
1,1,1-trichloroethane (degreasing maintenance)	X Yes	___ No
carbon tetrachloride	___ Yes	_|_ No
chlorinated fluorocarbons	___ Yes	_|_ No

2. Does the handler generate any of the following F002 constituents (i.e., spent halogenated solvents) as a result of being used in the process either in pure form or commercial grade?

tetrachloroethylene	___ Yes	_|_ No
trichloroethylene	___ Yes	_|_ No
methylene chloride	___ Yes	_|_ No
1,1,1-trichloroethane	___ Yes	_|_ No
chlorobenzene	___ Yes	_|_ No
trichlorofluoromethane	___ Yes	_|_ No
1,1,2-trichloro-1,2,2-trifluoroethane	___ Yes	_|_ No
ortho-dichlorobenzene	___ Yes	_|_ No

3. Does the handler generate any of the following F003 constituents (i.e., spent nonhalogenated solvents) as a result of being used in the process either in pure form or commercial grade?

xylene	X Yes	___ No
acetone	___ Yes	_/_ No
ethyl acetate	X Yes	___ No
ethyl benzene	___ Yes	_|_ No
ethyl ether	___ Yes	_|_ No
methyl isobutyl ketone	X Yes	___ No
n-butyl alcohol	X Yes	___ No
cyclohexanone	___ Yes	_/_ No
methanol	X Yes	X No

If the F003 wastestream has been mixed with a solid waste, does the resultant mixture exhibit the ignitability characteristic? X Yes ___ No

Handler Name: East Coast Sanding
ID Number: NJD000631937
Inspector: Tarlton/Stancil
Date: 9/23/87

4. Does the handler generate any of the following F004 constituents (i.e., spent nonhalogenated solvents) as a result of being used in the process either in pure form or commercial grade?

Comments

cresols and cresylic acid	___Yes	X No
nitrobenzene	___Yes	X No

5. Does the handler generate any of the following F005 constituents (i.e., spent nonhalogenated solvents) as a result of being used in the process either in pure form or commercial grade?

toluene	___Yes	X No
methyl ethyl ketone	X Yes	___No
carbon disulfide	___Yes	X No
isobutanol	___Yes	X No
pyridine	___Yes	X No

6. Are any of the constituents listed in the questions 1-5 used for their "solvent" properties -- that is to solubilize (dissolve) or mobilize other constituents? The following questions will be helpful in confirming this determination.

(a) Chemical carriers? X Yes ___No

If the answer is yes, list the constituents.

MIBK, XYLENE, ETHYL ACETATE
N, BUTYL ALCOHOL, MEK

(b) Degreasing/cleaning? X Yes ___No

If the answer is yes, list the constituents.

111 TRICHLOROETHANE

(c) Diluents? ___Yes X No

If the answer is yes, list the constituents.

Handler Name: East Coast Sanitary
ID Number: NJD063193
Inspector: Taylor / Stacy
Date: 9/23/87

(d) Extractants? ___Yes X No Comments

If the answer is yes, list the constituents.

(e) Fabric scouring? ___Yes X No

If the answer is yes, list the constituents.

(f) Reaction and synthesis media? ___Yes X No

If the answer is yes, list the constituents.

If questions 1-6 led the inspector to believe that the waste may be an F-solvent, answer question 7.

7. Are any of the above constituents spent solvents? A solvent is considered "spent" when it has been used and is no longer used without being regenerated, reclaimed, or otherwise reprocessed. X Yes ___No

8. If the waste is a mixture of constituents as determined in questions 1-7, answer this to determine whether it is a "solvent mixture" covered by the listings.

   If the wastestream is mixed and contains more than one of the F001-F005 constituents listed in questions 1-5 (by volume), give the concentration before use of all the constituents in the solvent mixture/blend. For example:

   5% methylene chloride
   2% trichloroethylene
   25% 1,1,1-trichloroethane
   68% mineral spirits
   100%

   If the wastestream is a mixture containing a total of 10% or more (by volume) of one or more of the F001, F002, F004, or F005 listed constituents before use, it is a listed waste.

Handler Name: East Coast Surgical
ID Number: NJD000631951
Inspector: Jaylen Isaacs
Date: 7/23/87

Comments

With respect to the F003 solvent wastes, if, before use, the wastestream is mixed and contains only F003 constituents, it is a listed waste. For example:

33%	acetone
16%	methanol
51%	ethyl ether
100%	

If the wastestream is a mixture containing F003 constituents and a total of 10% or more of one or more of the F001, F002, F004, and F005 listed constituents before use, it is a listed waste.
For example:

50%	xylene	F003
12%	TCE	F001
38%	mineral spirits	
100%		

If in light of the above, the handler appears to be generating F001-f005 hazardous wastes, refer this facility to the enforcement official for follow-up actions verifying the use of solvents at the facility.

REFERENCE NO. 7

12-15-01 CFD

Let's protect our earth

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF HAZARDOUS WASTE MANAGEMENT

Michele M. Putnam
Deputy Director

Hazardous Waste Operations

John J. Trela, Ph.D., Director
401 East State St.
CN 028
Trenton, N.J. 08625-0028
(609)633-1408

Lance R. Miller
Deputy Director

Responsible Party Remedial Action

Mr. Steven Baldwin
Manager Hazardous Waste
Johnson & Johnson Products, Inc.
501 George Street, ESDP, EP-132
New Brunswick, NJ 08903

OCT 13 1988

Dear Mr. Baldwin:

RE: Notice of Deficiency for Closure Plan, Johnson & Johnson Eastern Surgical Dressing Plant, North Brunswick, EPA ID NO. NJD 000 631 937

The Bureau of Hazardous Waste Engineering (the Bureau) acknowledges receipt of Eastern Surgical Dressing Plant's (ESDP) closure plan for their former outdoor hazardous waste container storage area. The plan was submitted as Appendix B to ESDP'S Part B permit application for a new indoor hazardous waste container storage area constructed on-site.

Be advised the the Bureau has completed their review of the plan and has found it to be deficient. The plan has also been submitted for review by the Bureau of Environmental Measurements and Quality Assurance (BEMQA). The following comprises the comments of BEMQA and the Bureau as they relate to your plan:

1.02 Facility Description

a. Please indicate what the outdoor storage area will be used for following closure (i.e. storage, production, etc.).

b. Provide additional map(s) which clearly show the location of the outdoor storage area in relation to the indoor storage area, xylene recycle area, and ESDP as a whole. Include such details as berms, walls, doors, and buildings where applicable. Distinguish between soil and concrete or asphalt areas.

2.04 Decontamination of Equipment and Structures

a. Indicate the parameters which collected washwater will be analyzed for and provide rationale that these parameters are sufficient to identify all potential hazardous waste constituents.

b. The background sample must be taken from a clean non-production area upgradient of the outdoor storage area. It cannot be taken from beneath the concrete pad as specified.

OCT 13 1988

2.05 Testing to Ensure Decontamination

a. In addition to the analysis of soil samples, the analysis of collected washwater is to be a determining factor in ensuring facility decontamination.

b. Additional soil samples are to be collected outside the perimeter of the outdoor storage area where soils may be affected.

c. A map must be provided which shows the proposed locations for all soil samples; including background.

d. Soil samples are to be analyzed for total volatile organics from the Target Compound List and not volatile halogenated organics as specified in the plan.

Table B1 Analytical Methods

a. The laboratory conducting the soil analysis must utilize CLP SOW for Organics and Inorganic Analysis or SW-846, 3rd edition methodologies.

b. Data results must be reported according to the latest version of USEPA CLP format deliverables requirements if SOW for Organics and Inorganic Analysis is utilized. If 3rd edition SW-846 methodologies are used, then at a minimum, results must meet the deliverables format requirements as specified in the 3rd edition SW-846.

Attachment C Sample Preservation

Aqueous samples for metals analysis should not be filtered. Filtering is done only when dissolved metals is a parameter of concern.

Attachment F Surface Soil Sampling

a. All samples must be collected with a stainless steel trowel or hand auger. Sampling equipment must be laboratory cleaned and dedicated to a sampling point or field decontaminated in the following manner:

1. Non-phosphate detergent plus tap water wash
2. Tap water rinse
3. Distilled/deionized water rinse
4. 10% nitric acid rinse* (trace metal or higher grade HNO_3 diluted with distilled/deionized H_2O)
5. Distilled/deionized water rinse*
6. Acetone (pesticide grade) rinse*
7. Total air dry or pure nitrogen blow out**
8. distilled/deionized water rinse**

* Only if sample is to be analyzed for metals.
** Only if sample is to be analyzed for organics.

b. Disposable gloves should be utilized for sample collection and must be changed between sample locations.

c. Whirl packs are not acceptable sample containers. Volatile organic samples should be placed in 40ml vials with Teflon lined screw caps and all other samples can be placed in 8oz. wide mouth containers. All containers should be laboratory cleaned as recommended in the analytical methodology and originate in the laboratory performing the analysis.

d. Trip and field blank procedures are not specified in the plan. Recommended procedures are as follows:

1. Field blanks must be performed at a rate of one per day. Field blanks consist of two (2) sets of identical containers, one filled with demonstrated analyte free water which originates in the laboratory performing the analysis, and one empty set of containers. At the field location, in the most contaminated area, the water is passed through the decontaminated sampling device into the empty set of bottles.

2. Trip blanks must be included at a rate of one per 2 day event or per sample shipment (not to exceed 2 days). They must be filled with demonstrated analyte free water and originate from the laboratory performing the analysis.

3. Trip blanks should be analyzed for volatile organic parameters. Any other parameters for analysis are at the discretion of the NJDEP. Field blanks should reflect the same parameters as samples collected that day.

4. Trip and field blank samples must arrive on-site within one day of preparation in the lab and may be held on site for no longer than two calendar days. Blanks and all samples must be maintained at $4^{o}C$ while on-site and during shipment.

5. A minimum of one (1) duplicate per 20 samples is required.

In addition, the Bureau and BEMQA must be notified at least two (2) weeks prior to the initiation of sampling activities so that a field audit may be performed.

Within thirty (30) days from the date of this letter, ESDP should submit to the Bureau a revised closure plan for the former outdoor container storage area which takes into account all of the aforementioned deficiencies. Each deficiency must be adequately addressed in order for review of the plan to continue toward approval.

OCT 13 1988

If you have any questions on this matter, please direct them to Scot J. Frow of my staff at (609) 292-9880.

Very truly yours,

Ernest J. Kuhlwein, Jr., Chief
Bureau of Hazardous Waste Engineering

EP48/cfd
cc: Barry Tornick, USEPA
William F. Lowry, BEMQA
Vince Krisak, BCE

DOCUMENT: JOHNSON1
FOLDER: CFDMOB

REFERENCE NO. 8

Johnson & Johnson
HEALTH CARE COMPANY
NEW BRUNSWICK, NJ 08903-2400

December 6, 1988

Mr. Ernest J. Kuhlwein, Jr. Chief
Bureau of Hazardous Waste Engineering
New Jersey Department of Environmental Protection
401 East State Street
CN 028
Trenton, New Jersey 08625-0028

Dear Mr. Kuhlwein

In response to your letter dated November 7, 1988, the following items have been addressed:

1. The catch basin was relocated to the point indicated on drawing number 100 (outside the new wall). There is a sanitary sewer line that runs under a portion of our new Hazardous Waste Facility but there are no outlets to it from inside the facility.

2. See attached map labeled "ESDP Building and Grounds" which shows the location of the PSE&G substation.

3. The location of the 30 inch gas main is detailed in Figure #2 "Site Map" already submitted in our "Part B" Application.

4. There is only one vehicle access route to our Hazardous Waste Facility. Any vehicles using that route must register at our Main Guard Post. For hazardous waste pick ups the driver and any helpers are issued "Contractors Badges" and a "Truck Pass". They are instructed to go to our area. The guard stationed in the second post is informed that th truck is coming and to allow him to pass through. After the truck is loaded we sign and date his pass. The vehicle then returns to the main post where the badges are returned and his pass turned in.

   The size of the waste hauling vehicles vary. The waste material is hauled out in either a 22 ft., 26 ft. or 44 ft. trailer. We have had 14 pick-ups so far this year.

5. The drawings submitted in our original Part B permit application are our as-built drawings. These drawings were the ones used and approved when we applied for our building permit from North Brunswick Township.

6. The actual capacity of our Drum Storage Area is 296 drums. We would like our permit to reflect that.

7. The concrete floor in the drum storage area is painted with an epoxy paint and all gaps were sealed. The material used for the flooring is 4,500 lb. per square foot concrete. We feel this is strong enough to support the maximum loading without failure.

8. Rather than a sketch we would like to offer a description. Our pallet rack is constructed to allow two feet of separation, both horizontally and vertically, from adjacent pallets with each pallet location having its own individual sprinkler head.

The generating sources of all wastes are required to serial number each waste accumulation drum, labeling each drum with a complete list of all the individual constituents of each raw material waste contained. The generating departments are also required to submit a transfer sheet that contains the same information. The drums are then assigned a location in our waste drum storage racks. We record the location for each drum. Drums are palletized, three or four containers to one pallet. Hazard Classes, Ignitable, Ingnitable and Corrosive, Corrosive and Non-Regulated are never stored on a common pallet. Also all drums are required to have the appropriate DOT hazard label affixed if the drum's contents warrant it.

9. The only other types of containers we would store in our racks would be DOT 17E's (Closed Head 55 gallon Drums) or DOT 12B's (Fiber Containers with a poly liner) holding no more than 40 lbs. of rags used in solvent cleaning (xylene) or rags holding oil from our facilities or manufacturing maintenance departments.

10. Our daily inspection log was revised and put into use the first week of October 1988. This log now shows the date and time of inspection, the condition of the pallets that hold our drums, date and nature of any problems that were found, and when the corrective action took place. Please see attached example.

The reason for the apparent discrepancies between the two forms is that one form (Waste Storage Facility Inspection Log) is specific for our Waste Storage Facility. The other form is a monthly safety equipment inspection form supplied to us by our facility maintenance group.

11. Please find attached documents showing our request for semi-annual drills. Also on November 7, 1988 a group of fire fighters from North Brunswick Volunteer Fire Department toured our facility. We are trying to arrange semi annual drills and have regular fire inspection by North Brunswick. Since it is a volunteer organization it is difficult to arrange such drills. We have an internal Fire Brigade and First Aid Squad which is well equipped to handle most emergencies that we may have. Please see attached correspondences.

12. Our emergency notification procedures were revised in June of 1988. Please see attached.

13. This is being done. When attending a Hazardous Waste Training Session the personnel involved are asked to sign and print their name, job title and department they work for. The original sign-in-sheets are kept in our records and copies are sent to the Personnel Dept.

14. Our training program defines the general categories of hazardous waste, the types routinely generated here at ESDP and characteristics of each. Emphasis is on proper handling techniques to avoid contamination or injury. Techniques are given to respond safely to incidents involving fire, explosions and spills of hazardous materials and waste.

    There are other training programs given annually to all our employees at ESDP which help to reinforce our hazardous waste training. These include OSHA Employee Right to Know, Evacuation Training, and the Proper Use of Fire Extinguishers (which is a "hands on" program sponsored by our Fire Brigade).

15. All sampling and analysis procedures for facility closure will reflect procedures specified in our waste analysis plan, recommendations and any revisions made by the NJDEP.

16. All floors, surfaces, racks, piping and spill containment tank will be thoroughly washed with surfactants before being triple rinsed.

17. Please add Barium to our list of Priority Pollutant Metals for which our washwater will be analyzed at closure.

18. Please find attached Hazardous Waste Management and Disposal Employee Profiles for Stephen E. Baldwin, Manager Hazardous Waste Storage and Disposal; John R. Kenyon, Supervisor Hazardous Waste Storage and

Disposal; and, Frank Blando, Hazardous Waste Storage and Disposal Technician.

19. a) Waste Flammable Solid, N.O.S. -- D001.

b) The polymeric adhesive residues usually contain the residues of the following raw materials:

Polyethyleneglycol adipate, pigment, butyl benzyl phthalate, polyvinyl chloride resin, silicon, ethylhexal acrylate, ethyl acetate, vinyl acetate and xylene.

At times the solvents MIBK and MEK will also be involved.

c) This waste comes from the clean up and the changing over of equipment and machinery from one of our manufacturing departments. The materials in the polymeric adhesive residues are the raw materials used in the process. The source is from changing over and cleaning up it is difficult to say how much of each ingredient is in a drum. Since ignitability tests are performed on samples from each drum we find it necessary, for prudence, to use the waste code D001 for each drum that tests positively.

d) The corrosive waste was sodium hydroxide flakes (solid) that was not used for boiler cleaning (a caustic). It was material that was no longer needed at ESDP and therefore became a waste. Only one rum was generated in 1987 and two drums in 1986. Corrosive wastes are not a regular waste stream for ESDP.

e) We wish to add to our list (Table I) F005. At times we have drums which contain Xylene and MEK with MEK constituting more than 10%. We have, in the past generated these drums as an F005 waste.

f) This is an aqueous waste stream. The known constituents are non-hazardous as listed on the MSD's supplied to us when purchased. We had one instance of reported lead in excess of 5 ppm by a TSDF to whom we had manifested a quantity of this waste for disposal. Each individual raw material comprising the formula from which this waste stream is generated was tested as well as the combined raw materials at each stage of our

manufacturing process. One item, "Bentonite" Clay (a collodial clay) was found to be the source of the level of lead. Subsequent tests on other lots and batches containing this clay have failed to detect lead at or in excess of 5 ppm. Nevertheless, we feel obligated to class this waste as D008 in order that the treatment at the TSD is effective in the event that a random unexpected level of lead above 5 ppm is encountered.

g) These are the results of independent laboratory analysis of our D008 waste (results dated November 18, 1987), D001, F003, F005 and X726 wastes (results dated October 27, 1987).

h) We have recently submitted samples of our ignitable waste stream for independent analysis. We will forward the results of this testing as soon as we receive it.

20 & 21. The greatest portion of our wastes come from our manufacturing process. The remainder comes from our maintenance groups and occasional lab pack from our Quality Assurance/Technical Services Laboratories. Johnson & Johnson Health Care ESDP has a very stringent raw material quality assurance program. All raw materials (including xylenes, MEK, MIBK, bentonite clay) fall under that program

The constituents contained in all our raw materials are known by means of vendor MSDS. Quality Assurance specifications and subsequent in-coming sampling and tests by our Quality Assurance Laboratories. The testing includes infra-red spectrographic analysis to verify the consistency each individual lot delivered is identical to that specified and that which has been experienced on lots delivered in previous shipments. Our Technical Services Group, responsible for product quality and the raw materials contained therein, have reviewed all raw materials for compatibility. The review indicates that all constituents in a drum are compatible and the waste generated from these materials can be co-mingled in accumulation containers. For classification, storage and disposal purposes our Hazardous Waste Management does require separation of certain waste streams into separate drums.

The wastes generated from our maintenance groups and laboratories are verified by our knowledge of what the compounds were when purchased (MSDS) and what they were used for.

Each drum of waste codes D001, F002, F003, F005 and X726 presented by generating sources are tested for ignitability and corrosivity.

The method we use to test in-house for ignitability is the one specified in the New Jersey Administrative Code Title 7: Chapter 26-8.9 "Characteristics of Ignitability". We use a Setaflash Closed Cup Tester following the test method specified in ASTM Standard D-3278. Our procedures are as follows:

The method used is a GO / NO GO situation. The Setaflash's vapor generating conditions are set at 140 degrees F (+/- 2 degrees F) with a one minute specimen chamber dwell time prior to introduction of the ignition source. The results for each drum are recorded.

Corrosivity is tested for by using pH paper. In addition, since we are primarily a storage facility and manifest our hazardous waste to federal and state approved disposal facilities, we cannot ship our waste until these facilities have done their own characterization of our waste and given us approval.

The methods that are used by the TSDS which receive our hazardous waste are incineration, fuel blending, recovery and water treatment. We do not land dispose of any of our hazardous waste.

22. Please see response #20.

23. We have not filed for an Air Emissions Permit for our spill containment tank vent. It is an empty tank only to be used in case of an emergency. We did not see the need for a permit.

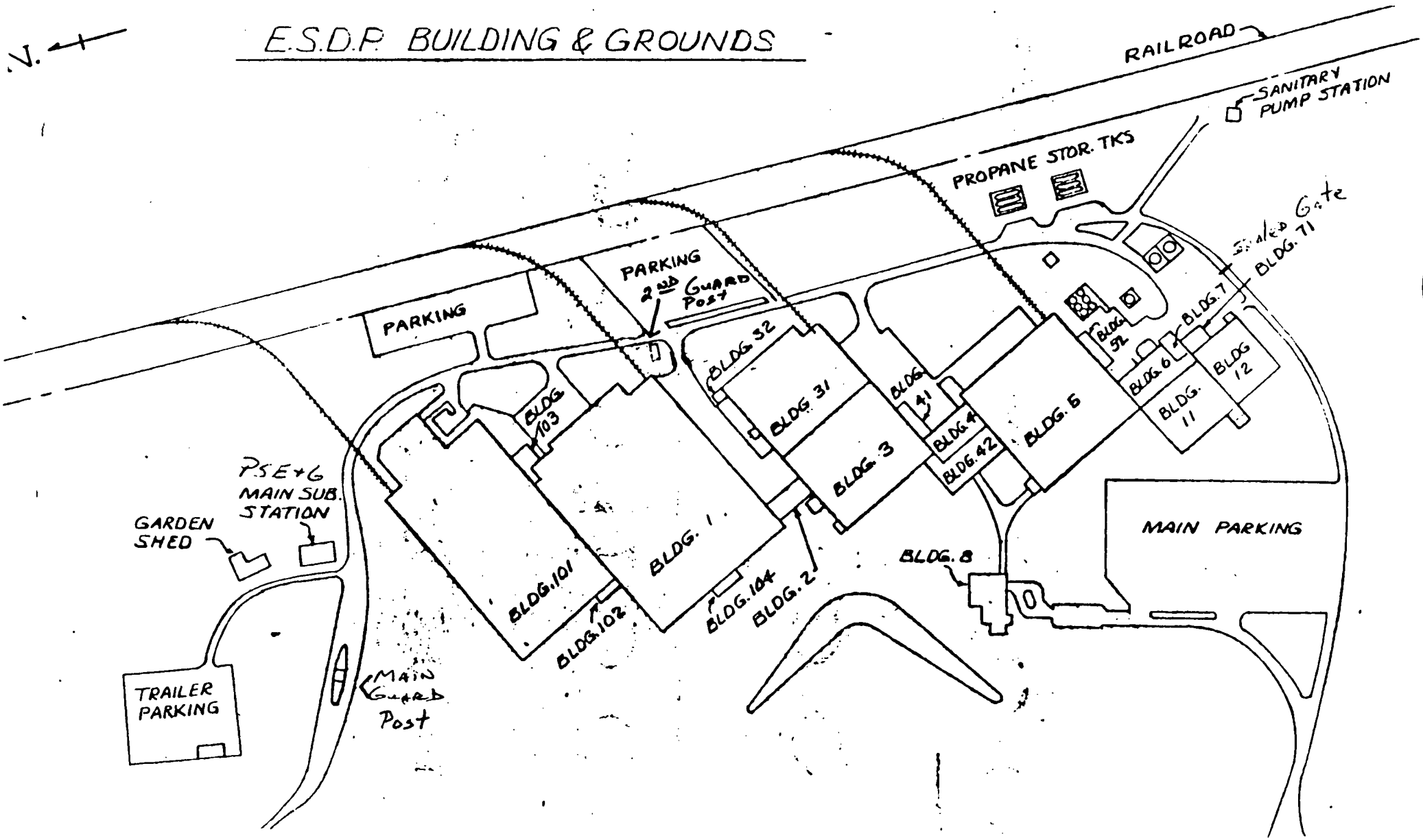
Please do not hesitate to contact me at (201) 422-5004 if you have any questions.

Sincerely,

Stephen E. Baldwin
Manager, Hazardous Waste
Disposal

SEB/koh

E.S.D.P. BUILDING & GROUNDS



REFERENCE NO. 9

NUS CORPORATION — TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8906-24-NA	7/27/89	9:50 AM

DISTRIBUTION: EASTERN Surgical Dressing Plt. JJP

BETWEEN:	OF: Div Haz Waste Mgmt	PHONE:
Mike Gage	NJDEP	(609) 426 0700

AND: Richard P. Huber (NUS)

DISCUSSION:

re - TSD Status.

- M. Gage informed me that Johnson and Johnson filed for TSD status as a precaution incase for some reason they had to store wastes beyond 90 days. J&J presently has a contracted hauler removing wastes every 30 days and a secondary contract incase something happens to the first hauler. Mr. Gage also indicated that J&J has no other activities that remotely require a TSD permit

ACTION ITEMS:

Richard P. Huber

NUS 067 REVISED 0681

REFERENCE NO. 10

The Complete Handbook of Hazardous Waste Regulation

A Comprehensive, Step-by-Step Guide to the Regulation of Hazardous Wastes Under RCRA, TSCA, and Superfund

Travis Wagner

PERRY-WAGNER PUBLISHING CO., INC.

A Leader in the Environmental Information Field

Brunswick, Maine Washington, D.C.

U031 1-Butanol (I)
*U159 2-Butanone (I,T)
U160 2-Butanone peroxide (R,T)
U053 2-Butenal
U074 2-Butene, 1,4-dichloro- (I,T)
U031 n-Butyl alcohol (I)

U136 Cacodylic acid
U032 Calcium chromate
*U238 Carbamic acid, ethyl ester
U178 Carbamic acid, methylnitroso-, ethyl ester
U176 Carbamide, N-ethyl-N-nitroso-
U177 Carbamide, N-methyl-N-nitroso-
U219 Carbamide, thio-
U097 Carbamoyl chloride, dimethyl-
U215 Carbonic acid, dithallium (I)salt
U156 Carbonochloridic acid, methyl ester (I,T)
U033 Carbon oxyfluoride (R,T)
*U211 Carbon tetrachloride
U033 Carbonyl fluoride (R,T)
U034 Chloral
U035 Chlorambucil
U036 Chlordane, technical
U026 Chlornaphazine
U037 Chlorobenzene
U039 4-Chloro-m-cresol
U041 1-Chloro-2,3-epoxypropane
U042 2-Chloroethyl vinyl ether
U044 Chloroform
U046 Chloromethyl methyl ether
U047 beta-Chloronaphthalene
U048 o-Chlorophenol
U049 4-Chloro-o-toluidine, hydrochloride
U032 Chromic acid, calcium salt
U050 Chrysene
U051 Creosote
U052 Cresols
U052 Cresylic acid
U053 Crotonaldehyde
U055 Cumene (I)
U246 Cyanogen bromide
U197 1,4-Cyclohexadienedione
U056 Cyclohexane (I)
U057 Cyclohexanone (I)
U130 1,3-Cyclopentadiene, 1,2,3,4,5,5-hexa- chloro- U058 Cyclophosphamide

U240 2,4-D, salts and esters

U071 Benzene, 1,3-dichloro-
U072 Benzene, 1,4-dichloro-
U017 Benzene, (dichloromethyl)-
U223 Benzene, 1,3-diisocyanatomethyl- (R,T)
U239 Benzene, dimethyl- (I,T)
* U201 1,3-Benzenediol
U127 Benzene, hexachloro-
U056 Benzene, hexahydro- (I)
U188 Benzene, hydroxy-
U220 Benzene, methyl-
U105 Benzene, 1-methyl-1,2,4-dinitro-
U106 Benzene, 1-methyl-2,6-dinitro-
U203 Benzene, 1,2-methylenedioxy-4-allyl-
U141 Benzene, 1,2-methylenedioxy-4-propenyl-
U090 Benzene, 1,2-methylenedioxy-4-propyl-
U055 Benzene, (1-methylethyl) (I)
U169 Benzene, nitro- (I,T)
U183 Benzene, pentachloro-
U185 Benzene, pentachloro-nitro-
U020 Benzenesulfonic acid chloride (C,R)
U020 Benzenesulfonyl chloride (C,R)
U207 Benzene, 1,2,4,5-tetrachloro-
U023 Benzene, (trichloromethyl)- (C,R,T)
U234 Benzene, 1,3,5-trinitro (R,T)
U021 Benzidine
U202 1,2-Benzisothiazolin-3-one,1,1-dioxide
U120 Benzo(j,k)fluorene
U022 Benzo(a)pyrene
U022 3,4-Benzopyrene
U197 p-Benzoquinone
U023 Benzotrichloride (C,R,T)
U050 1,2-Benzphenanthrene
U085 2,2'-Bioxirane (I,T)
U021 (1,1'-Biphenyl)-4,4'-diamine
U073 (1,1'-Biphenyl)-4,4'-diamine, 3,3'-dichloro-
U091 (1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethoxy-
U095 (1,1'-Biphenyl)-4,4'-diamine, 3,3'-dimethyl- U024 Bis(2-chloroethoxy) methane
U027 Bis(2-chloroisopropyl) ether
U244 Bis(dimethylthiocarbamoyl) disulfide
U028 Bis(2-ethyhexyl)phthalate (DEHP)
U246 Bromine cyanide
U225 Bromoform
U030 4-Bromophenyl phenyl ether
U128 1,3-Butadiene, 1,1,2,3,4,4-hexachloro
U172 1-Butanamine, N-butyl-N-nitroso-
U035 Butanoic acid, 4-[Bis(2-chloroethyl)amino]benzene-

U143 Lasiocarpine
U144 Lead acetate
U145 Lead phosphate
U146 Lead subacetate
U129 Lindane

U147 Maleic anhydride
U148 Maleic hydrazide
U149 Malononitrile
U150 Melphalan
U151 Mercury
U152 Methacrylonitrile (I,T)
U092 Methanamine, N-methyl- (I)
U029 Methane, bromo-
U045 Methane, chloro- I,T)
U046 Methane, chloromethoxy-
U068 Methane, dibromo-
U080 Methane, dichloro-
U075 Methane, dichlorodifluoro-
U138 Methane, iodo-
U119 Methanesulfonic acid, ethyl ester
U211 Methane, tetrachloro-
U121 Methane, trichlorofluoro-
U153 Methanethiol (I,T)
U225 Methane, tribromo-
U044 Methane, trichloro-
U121 Methane, trichlorofluoro-
U123 Methanoic acid (C,T)
U036 4,7-Methanoindan, 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a- tetrahydro-
* U154 Methanol (I)
U155 Methapyrilene
U247 Methoxychlor
U154 Methyl alcohol (I)
U029 Methyl bromide
U186 1-Methylbutadiene (I)
U045 Methyl chloride (I,T)
U156 Methyl chlorocarbonate (I,T)
U226 Methyl chloroform
U157 3-Methylcholanthrene
U158 4,4'-Methylenebis(2-chloroaniline)
U132 2,2'-Methylenebis(3,4,6-trichlorophenol)
U068 Methylene bromide
U080 Methylene chloride
U122 Methylene oxide
U159 Methyl ethyl ketone (I,T)
U160 Methyl ethyl ketone peroxide (R,T)
U138 Methyl iodide

*	U161	Methyl isobutyl ketone (I)
	U162	Methyl methacrylate (I,T)
	U163	N-Methyl-N'-nitro-N-nitrosoguanidine
	U161	4-Methyl-2-pentanone (I)
	U164	Methylthiouracil
	U010	Mitomycin C
	U059	5,12-Naphthacenedione,(8S-cis)-8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxyl)-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methyoxy-
*	U165	Naphthalene
	U047	Naphthalene,2-chloro-
	U166	1,4-Naphthalenedione
	U236	2,7-Naphthalenedisulfonic acid,3,3'-[(3,3'-dimethyl-(1,1'bi-phenyl)-4,4'diyl)]-bis(azo)bis(5-amino-4-hydroxy)-, tetrasodium salt
	U166	1,4,Naphthaquinone
	U167	1-Naphthylamine
	U168	2-Naphthylamine
	U167	alpha-Naphthylamine
	U168	beta-Naphthylamine
	U026	2-Naphthylamine, N,N'-bis(2-chloromethyl)-
*	U169	Nitrobenzene (I,T)
	U170	p-Nitrophenol
	U171	2-Nitropropane (I)
	U172	N-Nitrosodi-n-butylamine
	U173	N-Nitrosodiethanolamine
	U174	N-Nitrosodiethylamine
	U111	N-Nitroso-N-propylamine
	U176	N-Nitroso-N-ethylurea
	U177	N-Nitroso-N-methylurea
	U178	N-Nitroso-N-methylurethane
	U179	N-Nitrosopiperidine
	U180	N-Nitrosopyrrolidine
	U181	5-Nitro-o-toluidine
	U193	1,2-Oxathiolane,2,2-dioxide
	U058	2H-1,3,2-Oxazaphosphorine,2-[bis(2-chloroethyl)amino] tetrahydro-, oxide 2-
	U115	Oxirane (I,T)
	U041	Oxirane, 2-(chloromethyl)-
	U182	Paraldehyde
	U183	Pentachlorobenzene
	U184	Pentachloroethane
	U185	Pentachloronitrobenzene
	U186	1,3-Pentadiene (I)
	U187	Phenacetin

✳	U188	Phenol
	U048	Phenol, 2-chloro-
	U039	Phenol, 4-chloro-3-methyl-
	U081	Phenol, 2,4-dichloro-
	U082	Phenol, 2,6-dichloro-
	U101	Phenol, 2,4-dimethyl-
	U170	Phenol, 4-nitro-
	U137	1,10-(1,2-phenylene)pyrene
	U145	Phosphoric acid, Lead salt
	U087	Phosphorodithioic acid O,O-diethyl-,S-methylester
	U189	Phosphorous sulfide (R)
	U190	Phthalic anhydride
	U191	2-Picoline
	U192	Pronamide
	U194	1-Propanamine (I,T)
	U110	1-Propanamine, N-propyl- (I)
	U066	Propane, 1,2-dibromo-3-chloro-
	U149	Propanedinitrile
	U171	Propane, 2-nitro- (I)
	U027	Propane, 2,2'-oxybis(2-chloro)-
	U193	1,3-Propane sultone
	U235	1-Propanol, 2,3-dibromo-,phosphate(3:1)
	U126	1-Propanol, 2,3-epoxy-
	U140	1-Propanol, 2-methyl- (I,T)
	U002	2-Propanone (I)
	U007	2-Propenamide
	U084	Propene, 1,3-dichloro-
	U243	1-Propene, 1,1,2,3,3,3-hexachloro-
	U009	2-Propenenitrile
	U152	2-Propenenitrile, 2-methyl- (I,T)
	U008	2-Propenoic acid (I)
	U113	2-Propenoic acid, ethyl ester (I)
	U118	2-Propenoic acid, 2-methyl-, ethyl ester
	U162	2-Propenoic acid, 2-methyl, methyl ester (I,T)
	U194	n-Propylamine (I,T)
	U083	Propylene dichloride
	U196	Pyridine
	U155	Pyridine, 2-[(2-(dimethylamino)-2-thenylamino)]
	U179	Pyridine, hexahydro-N-nitroso-
	U191	Pyridine, 2-methyl-
	U164	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
	U180	Pyrrole, tetrahydro-N-nitroso-
	U200	Reserpine
	U201	Resorcinol
	U202	Saccharin and salts

U203 Safrole
U204 Selenious acid
U204 Selenium dioxide
U205 Selenium disulfide (R,T)
U015 L-Serine, diazoacetate (ester)
U089 4,4'-Stilbenediol,alpha,alpha'-diethyl-
U206 Streptozotocin
U135 Sulfur hydride
U103 Sulfuric acid, dimethyl ester
U189 Sulfur phosphide (R)
U205 Sulfur selenide (R,T)

U207 1,2,4,5-Tetrachlorobenzene
U208 1,1,1,2-Tetrachloroethane
U209 1,1,2,2-Tetrachloroethane
U210 Tetrachloroethylene
U213 Tetrahydrofuran (I)
U214 Thallium(I) acetate
U215 Thallium(I) carbonate
U216 Thallium(I) chloride
U217 Thallium(I) nitrate
U218 Thioacetamide
U153 Thiomethanol (I,T)
U219 Thiourea
U244 Thiram
* U220 Toluene
U221 Toluenediamine
U223 Toluenediisocyanate (R,T)
U328 *o*-Toluidine
U222 o-Toluidine hydrochloride
U353 *p*-Toluidine
U011 1H-1,2,4-Triazol-3-amine
* U226 1,1,1-Trichloroethane
U227 1,1,2-Trichloroethane
U228 Trichloroethene
U228 Trichloroethylene
U121 Trichloromonofluoromethane
U234 sym-Trinitrobenzene (R,T)
U182 1,3,5-Trioxane, 2,4,5-trimethyl-
U235 Tris(2,3-dibromopropyl)phosphate
U236 Trypan blue

U237 Uracil, 5[bis(2-chloromethyl)amino]-
U237 Uracil mustard

U043 Vinyl chloride

U248 Warfarin, when present at concentrationsof 0.3% or less

*U239 Xylene (I)

U200 Yohimban-16-carboxylic acid, 11,17-dimethoxy-18-[(3,4,5 trimethoxy-benzoyl)oxy]-methyl ester

U249 Zinc phosphide, when present at concentrations of 10% or less

REFERENCE NO. 11

PRELIMINARY ASSESSMENT
OFF SITE RECONNAISSANCE
INFORMATION REPORTING FORM

Date: 7/24/89

Site Name: Eastern Surgical Dressing Plant TDD: 02-8906-24

Site Address: U.S. Route 1 & Aaron Rd.
Street, Box, etc.

North Brunswick
Town

Middlesex
County

N.J.
State

NUS Personnel:

Name	Discipline
Rich Hubner	Biologist
Kurt Fendler	Field Tech

Weather Conditions (clear, cloudy, rain, snow, etc.):

Clear, Hot, Sunny

Estimated wind direction and wind speed: 0-5 mph

Estimated temperature: 82°

Signature: [signature] Date: 7/24/89

Countersigned: Kurt Fendler Date: 7/24/89

PRELIMINARY ASSESSMENT

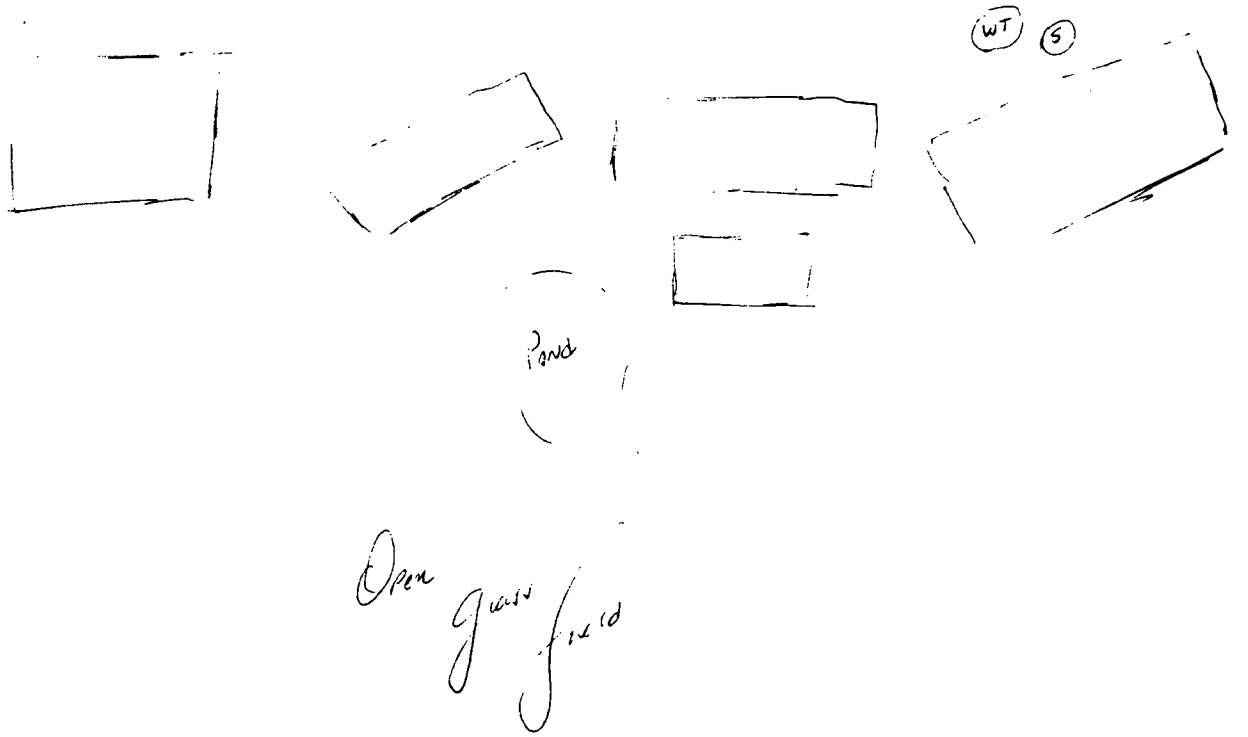
INFORMATION REPORTING FORM

Date: 7/24/89

Site Name: Ethicon Surgical TDD: 02-8906-24

Site Sketch:

Indicate relative landmark locations (streets, buildings, streams, etc.). Provide locations from which photos are taken.



Signature: _____ Date: 7/24/89

Countersigned: Kurt Keller Date: 7/24/89

PRELIMINARY ASSESSMENT

INFORMATION REPORTING FORM

Date: 7/24/89

Site Name: Eastern Surgical TDD: 02-8906-24

Notes (Periodically indicate time of entries in military time):

1130 arrived on site

Site is 0-3% slope and active but due to distance from road little can be observed. Site looks clean with no spills or stressed fauna. No fences are in evidence however guard houses were noted

1210 left site

Signature: [signature] Date: 7/24/89

Countersignature: Kurt Kendle Date: 7/24/89

PRELIMINARY ASSESSMENT

INFORMATION REPORTING FORM

Date: 7/24/89

Site Name: Eastern Surgical TDD: 02-8906-24

Notes (Cont'd):

Attach additional sheets if necessary. Provide site name, TDD number, signature, and countersignature on each.

Signature: [signature] Date: 7/24/89

Countersignature: Kurt Kendall Date: 7/24/89

PRELIMINARY ASSESSMENT

INFORMATION REPORTING FORM

Date: 7/24/89

Site Name: Eastern Surgical TDD: 02-8906-24

Photolog:

Frame/Photo Number	Time Date	Date ~~Time~~	Photographer	Description
4 SP	11:01	7/24	K. Kelder	Contamination of site
5 SP	11:01			
6 SP	11:02			
7 SP	11:02			
8 SP	11:02			

Attach additional sheets if necessary. Provide site name, TDD number, signature, and countersignature on each.

Signature: K.P. Date: 7/24/89

Countersignature: Kurt Kindler Date: 7/24/89

REFERENCE NO. 12

Well Number 2803495 REF.19 D

Well Number 2803432 REF.19 D

Well Number 2803419 REF.19 P

SITE

D-DOMESTIC P-PUBLIC SUPPLY(UNUSED)

SCALE 1:24000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 KILOMETER

CONTOUR INTERVAL 10 FEET

NUS CORPORATION	TITLE: THREE MILE VICINITY MAP
	SITE: EASTERN SURGICAL DRESSINGS PLANT J.J.P NORTH BRUNSWICK, N.J.
DATE: 8/1/89	
TDD: 02-8906-24	
QUAD: MONMOUTH JUNCTION, N.J.	FIGURE NUMBER:
	SCALE: 1"= 2000'

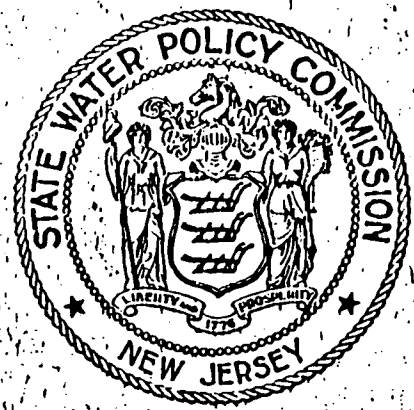

FRANKLIN
NORTH BRUNSWICK
SOUTH BRUNSWICK
NORTH BRUNSWICK
SITE
Well Number 2803445 REF. 19 D
Well Number 2803432 REF. 19 D
Well Number 2803419 REF. 19 P
D-DOMESTIC P-PUBLIC SUPPLY(UNUSED)
SCALE 1:24000
1 MILE
7000 FEET
1 KILOMETER
CONTOUR INTERVAL 10 FEET
NUS CORPORATION
TITLE: THREE MILE VICINITY MAP
SITE :
EASTERN
SURGICAL DRESSINGS PLANT J.J.P
NORTH BRUNSWICK, N.J.
DATE : 8/1/89
TDD : 02-8906-24
QUAD : MONMOUTH JUNCTION, N.J.
FIGURE NUMBER:
SCALE: 1"=2000'

REFERENCE NO. 13

Wer Din

STATE OF NEW JERSEY

STATE WATER POLICY COMMISSION



SPECIAL REPORT 8

THE GROUND-WATER SUPPLIES OF MIDDLESEX COUNTY, NEW JERSEY

Prepared in cooperation with the United States Department of the Interior, Geological Survey

1943

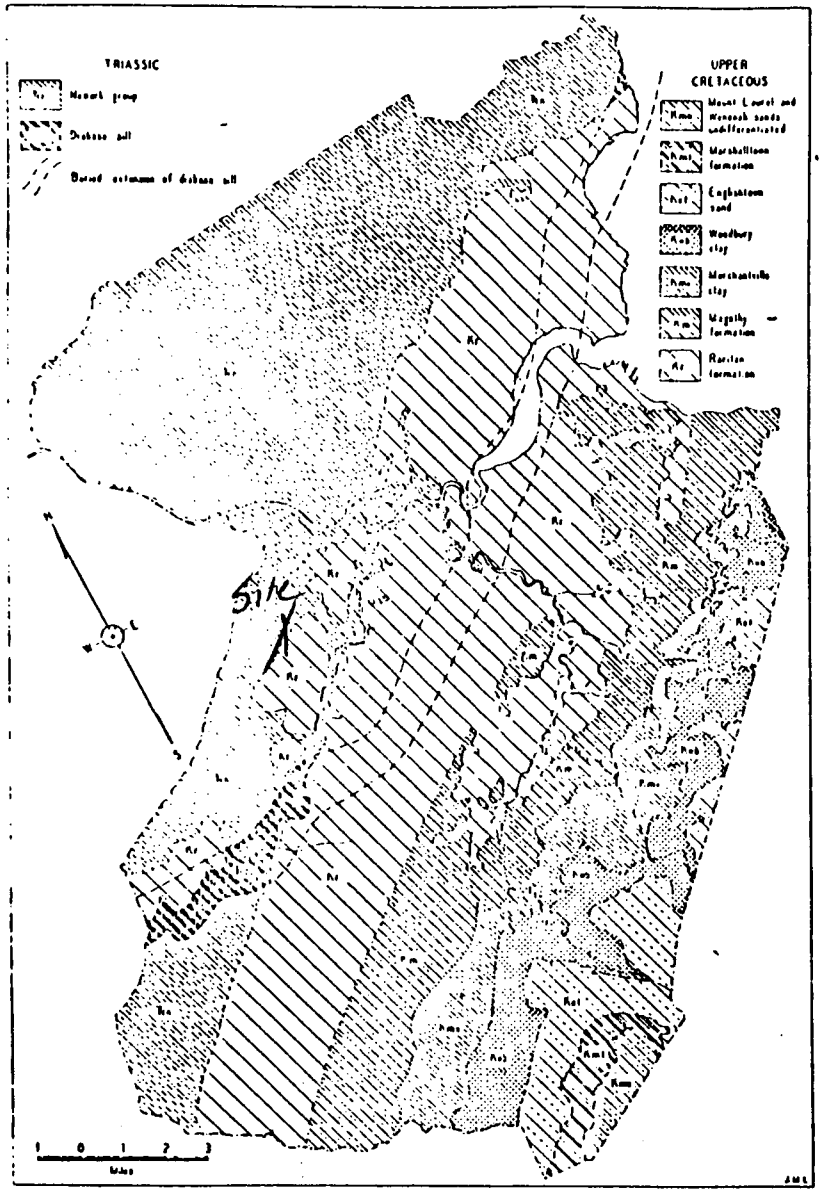


FIGURE 5.—Map of Middlesex County showing the exposures of the rocks of the Triassic and Cretaceous systems. Small quantities of good water are obtained from the Mount Laurel and Wenonah sands, the Englishtown sand and the Magothy formation within the county. Substantial quantities are derived from the Raritan formation and the rocks of the Newark group.

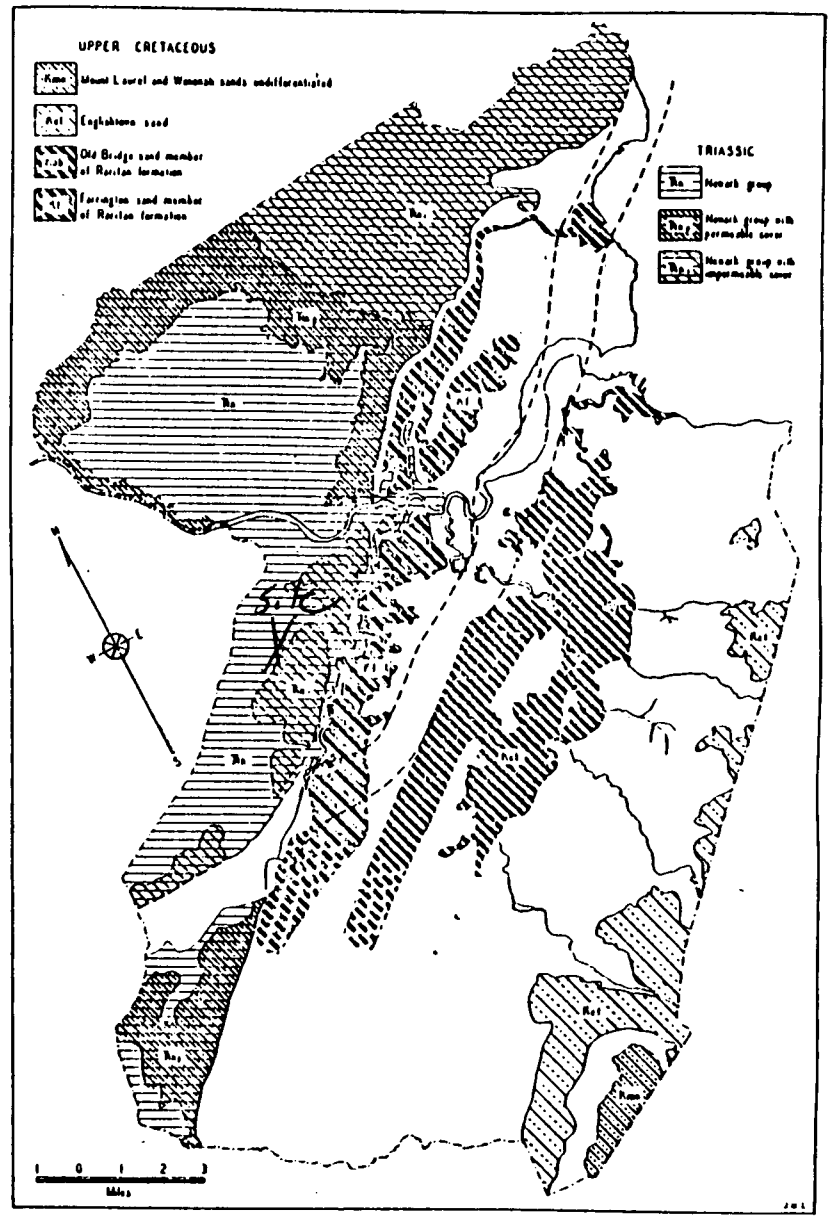


FIGURE 6.—Map of Middlesex County showing the intake areas of the important aquifers. Large quantities of good water are obtained from the Old Bridge and Farrington sand members of the Raritan formation. Small quantities are obtained from the Englishtown sand and the Mount Laurel and Wenonah sands. The rocks of the Newark group yield moderately large supplies where overlain by permeable materials, but elsewhere their yield is small.

yielding about 30 million gallons daily. The destruction of existing 'potential' ground-water supplies outside the county might be at least [illegible].

Another plan for the proposed canal contemplates a sea-level canal. In this case, there would be no locks to even retard the movement of salt water along the canal. The destruction of the ground-water supplies by a sea-level canal would be more rapid and possibly more complete than by the lock canal discussed above.

RARITAN FIRE-CLAY

The Raritan fire-clay, the lowest of the Cretaceous beds, includes the "Raritan potter's clay" of early reports and is an inconstant, variable member which, at its outcrop near Nixon, Bonhampton, Fords, Keasbey and Sayreville, has a thickness ranging from zero to 35 feet. The average thickness probably increases to the southeast as wells at East Brunswick, Old Bridge, Runyon, Parlin and South Amboy have encountered from 27 to 86 feet of blue, brown, gray or red clay at this stratigraphic horizon. Typically, the basal part of the clay has a brick-red color identical in shade with the underlying Triassic red shale from which it was derived. It has this same appearance where exposed in a recent roadcut northwest of Patricks Corner; but there the red clay is only a foot thick and is overlain by gray clay. Near the mouth of Deep Run brook, southwest of Nixon, the clay is mixed with sand and gravel, but half a mile to the northeast it is a relatively pure light-gray clay with a reddish tinge and is a little over six feet thick. The same clay is exposed in a pit half a mile south of the point where Lawrence Brook empties into the Raritan River. There its base is concealed, but the exposed portion 17 feet thick is a gray, "fat" clay of good quality.

TRIASSIC SYSTEM

Newark Group

In the investigations upon which this report is based, the study of the water-bearing properties of the rocks of the Newark group has been less detailed than those of the Old Bridge and Farrington sands. However, the rocks of the Newark group form one of the three most important aquifers in Middlesex County. This is true both because of the large amounts of water developed from them and because of their relatively wide extent. In much of that part of the county underlain by the coastal plain formations, two or more aquifers can be tapped at different depths by increasing the depth of drilling. In the area covered

by the Newark group, however, this is not true, because these rocks are very thick and essentially homogeneous, and because they are underlain by no other rocks that are capable of yielding any appreciable quantity of water.

GEOLOGY

As shown on the map on page 20, nearly all of the bed rock in Middlesex County northwest of a line roughly from Plainsboro through Monmouth Junction, Milltown and Woodbridge to Carteret is of Triassic age. The younger Quarternary formations form a relatively thin veneer on portions of the Triassic, particularly in the northern part of the county. South of the line mentioned the Triassic is overlain by Cretaceous deposits, but it has been penetrated by wells at Dunhams Corner, Parlin and South Amboy, and probably by the deep well near the Runyon pumping station.

The Triassic rocks in New Jersey belong to the Newark group which is divided into three formations, all of which are found in Middlesex County. The oldest is the *Stockton formation* which consists of conglomerate and sandstone interbedded with red shale. Next above is the *Lockatong formation* and this consists of hard shale and argillite of various hues. These two formations are found only in a small area between Milltown and Kingston near the southwestern border of the county. To the east they are covered by the younger Cretaceous rocks. The Stockton and Lockatong formations cannot be well seen or studied in the county, and they are not differentiated on the geologic maps.

The *Brunswick formation* is the youngest of the three formations of the Newark group, and within Middlesex County it crops out in a much greater area than the other two Triassic formations combined. It is a dull red shale interbedded with siltstones and occasional layers of sandstone. When dry it is a dense compact rock but it quickly softens and disintegrates when exposed to weathering.

In Middlesex County all the sedimentary rocks of the Newark group dip to the northwest at angles of 5° to 15°. The formations are rather impermeable except along the numerous cracks which everywhere traverse the beds at high angles to the bedding. Some water may also follow along the bedding planes, although such movement must be very restricted judging from actual experience with wells.

Molten rock was intruded into the Newark group in late Triassic time and in this region it solidified beneath the surface of the ground in the form of steeply dipping dikes and relatively flat sills. The largest of these is a diabase sill which is now exposed to the north in

Newark Bay and the Palisades, to the east on Staten Island, and to the west to Rocky Hill. Between these latter two exposures it is buried beneath a mantle of Cretaceous and Pleistocene sediments, but its position has been determined by the many wells which have encountered it and by geophysical exploration. Since it has an important bearing on the water supply of the region, its location has been shown on the geologic maps. The diabase sill stood as a ridge on the pre-Cretaceous surface and was continuous from Rocky Hill to Bayonne. Between Staten Island and Rocky Hill the surface was downfaulted prior to the deposition of the Cretaceous sediments. The first Cretaceous sediments were deposited on each side of the ridge but not on top of it. With continued deposition sandy material covered the higher slopes and then was deposited across it without a break as shown in figure 3. The Farrington sand is very thin or lacking on top of the buried trap ridge between Perth Amboy and South Amboy, but near the Borough of South River it is continuous across a lower segment of the ridge. Because of these geologic factors water cannot move easily from the intake area of the Farrington sand north of the ridge and near Perth Amboy directly south to the center of the fan from the sand near Parlin; but near the Borough of South River it readily can and does readily move across the trap ridge to the wells in that area.

The intrusion of this thick diabase sill profoundly affected the adjacent beds of shale, those nearest being altered to a tough, dark, flinty rock as hard as slate but lacking its cleavability. With increasing distance from the contacts the alteration is less and less pronounced, the rock becoming progressively softer and changing in color from dark gray, brown and greenish gray to light gray, purplish red, and finally the typical brick red of the unaltered shale. North of Middlesex County where the sill and adjacent beds are exposed, the latter are altered for a thickness of 500 feet or more from the contacts. In this region similar altered beds may be seen in a gully west of Patricks Corner, which is more than half a mile distant from the nearest outcrop of diabase but which is unquestionably underlain by that rock at a depth of a few hundred feet; and near the mouth of Mill Brook, two miles northwest of Sayreville, where the nearest exposure of diabase is a mile or more distant. Metamorphosed or altered shale has also been encountered by wells drilled in Milltown, Keasbey, Perth Amboy and Woodbridge, and by two boreholes respectively two miles east-southeast of Plainsboro and two miles east-northeast of Cranbury.

PHYSICAL PROPERTIES

The facts that the materials composing the rocks of the Newark group are usually fine-grained and relatively impermeable and that the formations are water-bearing by virtue of the cracks and crevices in the rocks, introduce special problems in any attempt to appraise their water-bearing capacity. Laboratory tests of ordinary samples of material collected in the field would be of no particular value, because they must of necessity deal with fragments of the rock and cannot indicate the capacity of the cracks between the undisturbed fragments as found in nature. Pumping tests provide the best means of studying the capacity of the group to yield water but very few have been made.

The permeability and the specific yield of the Newark group depend upon the degree of cracking. Since the degree of cracking decreases with the depth, the permeability and specific yield of the rocks also decrease with the depth. An advantage of pumping tests is that their results represent a composite of the conditions from top to bottom of the water-bearing part of the formation. The results of a pumping test may be directly expressed as a coefficient of transmissibility and a coefficient of storage. The coefficient of transmissibility is a measure of the ability of the formation to transmit water. It is the product of the average coefficient of permeability and the depth of the saturated portion of the aquifer. Under water-table conditions the coefficient of storage as determined in a pumping test is essentially the same as the average specific yield of the material. The cracks in the rocks of the Newark group intersect one another at many different angles with the result that the water in the rocks can generally move in any direction and is essentially under water-table conditions. Thus, without actually determining the effective depth of cracking of the aquifer or its characteristics at any given depth, it is possible by pumping tests to determine coefficients that are accurate indices of its capacity to store and transmit water.

Early in 1943 an opportunity arose to conduct a pumping test on some wells drawing from the rocks of the Newark group at Kenilworth, New Jersey, which is in Union County, about four or five miles north of the Middlesex County line at Rahway. At the site of the test the rocks of the Newark group were covered by a relatively permeable phase of the glacial till to a thickness of perhaps 30 or 40 feet. The results of the pumping test no doubt combine the characteristics of both the rock and the overlying materials to some extent. However, they are probably more representative of conditions in the shale than of those

in the overlying till. The results of the pumping tests at Kenilworth indicate that the coefficient of transmissibility of the rocks at that location is about 25,000 and that the coefficient of storage is about 0.0044.

The results of a single test cannot be considered representative of the whole Newark group. Nevertheless, they furnish a basis for an interesting comparison of the group with the aquifers of the coastal plain formations. The Farrington sand, for example, is about 80 feet thick and has an average coefficient of permeability of at least 1,200. Its coefficient of transmissibility would be the product of its thickness and its coefficient of permeability or at least 96,000. This means that the Farrington sand could transmit four or five times as much water as the rocks of the Newark group under a given head and through a given width of section.

The difference in the capacity of the two aquifers to store water is even more striking. It was estimated that a block of the Farrington sand one square mile in area and one foot thick could store about 27 million gallons of available water. If the sand is 80 feet thick, one square mile of it would store about 5,360 million gallons. If the thickness of the water-bearing part of the Newark group is assumed to be 200 feet and its specific yield 0.0044, one square mile of this aquifer could store only about 275 million gallons. Of course where there are overlying permeable sandy deposits, substantial additional quantities of water stored in these deposits, may be available to wells tapping the rocks. The low storage capacity of the rocks helps to explain the high rate of runoff and low ground-water flows observed on streams draining areas underlain by the Newark group where there is no permeable covering.

QUALITY OF WATER

With the exception of the waters that are contaminated by the intrusion of sea water, the water from the Triassic shales and sandstones of the Newark group is more highly mineralized than any other ground water obtained in Middlesex County. A majority of the wells tapping these rocks yield good water containing less than 200 or 300 parts per million of total solids, but it is not unusual to find several hundred parts per million of dissolved solids. The water is high in calcium and magnesium and the hardness is therefore high. The sulphates are high as compared with the carbonates and bicarbonates and much of the hardness is therefore noncarbonate or "permanent" hardness. In the water from one industrial well used for cooling, the total hardness expressed as calcium carbonate was reported to be 900 parts per million. Very often the waters from these formations also contain objectionable quantities of iron. The chlorides are usually fairly low.

The quality of the water from the Newark group varies from place to place and from one bed to another. The Stockton formation usually yields very good water. Water from the Brunswick shale, on the other hand, is sometimes more highly mineralized. In general, it may be said that where the beds yield water most freely its quality is likely to be better than in those localities where the crevices in the rock are small and the yield is low. Perhaps the greater circulation of meteoric waters through the more permeable beds has removed some of the objectionable soluble materials that have been retained in the less permeable rocks. The fact that better water is generally encountered near the surface than at greater depths tends to confirm this idea.

DEVELOPMENT AND PUMPAGE

A great many wells have been drilled into the Newark group in Middlesex County. The vast majority of them have produced some water. In fact, one reason for the importance of this group of rocks as an aquifer is that they will generally yield at least a small quantity of water to a well in almost any locality where they are encountered. Numerous small wells have been drilled in these rocks for domestic and farmstead water supplies, and most of them have been satisfactory for this purpose. The yield of these wells ranges from a few gallons per minute to 100 gallons per minute or more.

A considerable number of wells have also been drilled into these rocks for municipal or industrial water supplies. Where conditions are most favorable such wells may yield from 100 to 500 gallons per minute, or even more, but very high yields are exceptional. With one or two exceptions the larger developments tapping this aquifer within Middlesex County yield less than 500,000 gallons daily, but there are several well fields yielding water supplies ranging from 100,000 to 500,000 gallons daily or more, and a considerable number that produce 25,000 to 100,000 gallons daily.

A total of approximately 9.6 million gallons a day was withdrawn from the aquifers of the Newark group in Middlesex County in 1941 for municipal and industrial use. About 8.5 million gallons a day or 89 percent of the total was withdrawn from wells in the municipalities north of the Raritan River. Nearly 6.5 million gallons a day or 68 percent of the total was pumped from wells in the Borough of South Plainfield, practically all from wells owned by the Middlesex Water

REFERENCE NO. 14

MIDDLESEX COUNTY 208 AREA-WIDE

WASTE TREATMENT MANAGEMENT PLANNING

TASK 8 - GROUND-WATER ANALYSIS

A. DESCRIPTION OF GROUND-WATER SYSTEM
B. GROUND-WATER POLLUTION SOURCES

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HYDROGEOLOGIC FRAMEWORK

The study region is underlain by consolidated and unconsolidated rocks ranging in age from Precambrian to Recent. The northwestern part of the region covering about 160 square miles falls within the Triassic Lowland physiographic region and is underlain by sedimentary and igneous rocks. To the southeast lies the Coastal Plain, a region extending over some 220 square miles. The Coastal Plain is underlain by a thick wedge of sands, gravels, clays, and silts of Cretaceous age. These deposits were laid down by rivers in a deltaic environment and generally thicken in a downdip direction. Younger sediments overlie older sediments in a southeastward direction. The stratigraphic sequence of the various rock units together with their water-bearing properties is shown on Table 1.

Major ground-water reservoirs which are also the most heavily pumped are Triassic sandstones and shales of the Brunswick Formation and the Farrington and Old Bridge Sands of Cretaceous age. Aquifers of lesser importance are the Sayreville Sand, the Englishtown Sand, and the Mount Laurel and Wenonah Sands, all of Cretaceous age and the Pensauken Formation and glacial drift deposits of Pleistocene age.

The Triassic [redacted] north of the Raritan River is overlain by sediments of glacial age. East of Plainfield, these deposits consist mostly of glacial till (unsorted sand, gravel, boulders and clay),but to the west and south, permeable glacial outwash deposits are present. The aquifers extend beyond the confines of the study region; the Triassic aquifer northward into Union County and westward across the Millstone River into Somerset County,and the

Table 1 - Geologic Units and Their Ground-Water Potential in the Middlesex 208 Area.

System	Unit	Lithologic description	Thickness (feet)	Water-bearing characteristics
Quaternary	Alluvium	Silt, sand and mud	0 - 50	Relatively impermeable; no importance as source of water.
	Eolian deposits	Sand dunes	0 - 40	Of no importance as source of wate as mostly unsaturated.
	Stratified drift	Sand, gravel	0 - 60	Permeable and locally an important water source north of Raritan River.
	Non-stratified drift (till)	Clay, boulders, gravel, sand, silt	0 - 150	Of no importance as source of wate Absorbs precipitation and supplies recharge to underlying Triassic aqu
	Cape May Formation	Fine- to medium-grained quartz sand and some fine gravel	0 - 50	May fill pre-Cape May stream char nels and overlies portions of Triassi and Old Bridge aquifers. Locally exploited for domestic wells.
	Pensauken Formation	Clayey sand and gravel	0 - 70	Overlies portions of coastal plain and Triassic aquifers. Locally tapp by domestic wells that yield 50 to 100 gpm.
Cretaceous	Mount Laurel and Wenonah Sands	Micaceous sand	50	Lower portion of sand crops out alo southern Middlesex County border. Locally important aquifer.
	Marshalltown Formation	Micaceous, sandy clay	40	Confining bed.
	Englishtown Sand	Micaceous, fine- to medium-grained sand, some clay lenses	100	Present in limited area along south eastern Middlesex. Locally import as water source. Presently not dev oped.
	Woodbury Clay	Black, micaceous clay	50	Major confining zone to underlying aquifers.
	Merchantville Clay	Black, micaceous clay with glauconite	50 - 60	

Table 1 - (Continued)

System	Unit	Lithologic description	Thickness (feet)	Water-bearing characteristics
Cretaceous	Magothy Formation	Fine lignitic sand and black clay	90 - 130	Not important as aquifer. Well yi are low but sufficient for domestic purposes.
	Amboy Stoneware Clay	Gray to black clay with carbonaceous material	0 - 30	Considered to be lower facies of M thy Formation. Confining bed.
	Old Bridge Sand	Fine- to coarse-grained white to yellow sand	20 - 110	Major aquifer tapped by many well Median specific capacity is 20 gpm Transmissivity range 140,000 to 230,000 gpd/ft. Artificially recha in places. Well yields 200 to 1,0(gpm.
	South Amboy Fire Clay	Varicolored clay	0 - 35	Confining bed.
	Sayreville Sand	Fine, white micaceous sand	0 - 40	Not continuous. Unimportant as aquifer.
	Woodbridge Clay	Gray clay and clayey sand	50 - 100	Major confining bed overlying Far-rington Sand.
	Farrington Sand	Gray to yellow fine- to medium-grained sand. Contains some clay layers.	30 - 150	Major aquifer tapped by many well Median specific capacity is 29 gpm Transmissivity range: 50,000 to 150,000 gpd/ft. Well yields 500 t 2,000 gpm.
	Raritan Fire Clay	Varicolored basal clay	0 - 90	Confining bed.
Triassic	Brunswick Formation (Newark Group)	Red shale interbedded with siltstone and sandstone	5,000+	Major aquifer north of Raritan Rive Specific capacity is 0.1 to 25 gpm/ Transmissivity range 1,000 to 4,(gpd/ft. Well yields 50 to 700 gpm
	Lockatong Formation (Newark Group)	Hard shale and argillite	1,000+	Present only in small areas. Of little importance as aquifers.
	Stockton Formation (Newark Group)	Conglomerate and sandstone	1,000+	

Coastal Plain aquifers start at the Fall Line and probably continue southward into Mercer and Monmouth Counties. Tracing of the Old Bridge and Farrington Sands beyond the Middlesex County borders is difficult due to complex stratigraphic conditions.

Ground water in the bedrock aquifer is found in fractures and other openings, in contrast to the unconsolidated Coastal Plain deposits where ground water fills the voids between individual grains of the sediment. Both water-table and confined or artesian aquifers are present. The Triassic sandstone and shale and both the Farrington and Old Bridge Sands are under water-table conditions where exposed in the outcrop area. Where overlain by other sediments or zones of low permeability, these aquifers become confined.

Water-table aquifers are recharged by precipitation and sometimes by fluids disposed of in the subsurface, such as septic tank or cesspool effluent. Ordinarily, surface-water bodies act as discharge areas for water-table aquifers; however, in areas of heavy pumping where ground-water levels have fallen below river, stream, or lake levels, the water-table aquifers might receive recharge through surface-water infiltration if geologic conditions are favorable.

The artesian aquifers receive recharge from several sources, namely precipitation on the outcrop area, vertical leakage from confining beds above or below the aquifer, and infiltration of water from rivers or lakes in contact with the aquifer. The impact of man's activities has led to water-level declines and changes in natural head relationships as will be discussed shortly.

On the Coastal Plain, the extensively distributed and thick clay beds such as the Wood-

Table 2 - Selected Chemical Analyses of Ground Water in the Middlesex 208 Area (Concentrations in mg/l).

Aquifer	Period of Record	Chloride (Cl) N	Chloride (Cl) R	Chloride (Cl) M	Sulfate (SO_4) N	Sulfate (SO_4) R	Sulfate (SO_4) M	Nitrate (NO_3) N	Nitrate (NO_3) R	Nitrate (NO_3) M
Pleistocene deposits	1971	2	14 - 32	-	2	5 - 72	-	2	16.7 - 17.3	-
Englishtown Sand	1966 & 1972	-	-	-	-	-	-	-	-	-
Magothy Formation	1962 - 1973	1	14	-	-	-	-	1	0.44	-
Old Bridge Sand	1962 - 1975	28	3 - 35.4	12	4	11 - 23	-	8	0.00 - 17.7	0.06
	1923 - 1942	5	5.0 - 7.1	5.9	10	6 - 34	11	9	0.0 - 4.7	0.2
Sayreville Sand (?)	1954	2	10.0 - 17.7	-	2	37.2 - 39.5	-	2	0.05 - 0.89	-
Farrington Sand	1956 - 1975	42	1 - 28.2	4.9	4	0 - 10	-	6	0.00 - 7.8	0.28
Brunswick Formation	1957 - 1973	19	5.0 - 38	19	17	12 - 784	50	15	0.0 - 24	10

N - Number of samples

R - Range

M - Median - In the case of an even number of samples, the average of the two middle numbers was taken.

Table 2 - (Continued)

Aquifer	Period of Record	Total Dissolved Solids N	R	M	Alkalinity ($CaCO_3$) N	R	M	pH N	R	M
Pleistocene deposits	1971	2	76 - 370	-	2	16 - 180	-	2	6.2 - 7.4	-
Englishtown Sand	1966 & 1972	-	-	-	-	-	-	2	5.5 - 6.5	-
Magothy Formation	1962 - 1973	1	87	-	1	5	-	5	5.5 - 7.0	6.(
Old Bridge Sand	1962 - 1975	27	40 - 166	102	14	0 - 21	2	29	3.4 - 7.3	4.8
	1923 - 1942	9	19 - 65	29	7	0 - 4.9	1.6	-	-	-
Sayreville Sand (?)	1954	2	72 - 76.0	-	2	1.0 - 8	-	2	4.6 - 5.4	-
Farrington Sand	1956 - 1975	16	27 - 270	57	18	0.0 - 103	10.5	36	4.0 - 7.4	6.(
Brunswick Formation	1957 - 1973	18	210 - 3,700	321	19	38 - 209	130	21	6.3 - 8.0	7.5

Table 2 - (Continued)

Aquifer	Period of Record	Iron (Fe) N	Iron (Fe) R	Iron (Fe) M	Manganese (Mn) N	Manganese (Mn) R	Manganese (Mn) M	Total Hardness ($CaCO_3$) N	Total Hardness ($CaCO_3$) R	Total Hardness ($CaCO_3$) M
Pleistocene deposits	1971	2	0.09 - 0.3	-	-	-	-	2	40 - 328	-
Englishtown Sand	1966 & 1972	2	7 - 10	-	-	-	-	2	17.1 - 51.3	-
Magothy Formation	1962 - 1973	5	6 - 11.0	8	1	0.24	-	5	20 - 68.4	68.
Old Bridge Sand	1962 - 1975	28	0 - 8.0	2.14	21	0 - 0.70	0.20	27	8 - 61	25
	1923 - 1942	10	0.02 - 5.8	2.6	7	0.0 - 0.05	0.0	10	6 - 40	9.9
Sayreville Sand (?)	1954	2	0.8 - 1.2	-	1	0.03	-	2	6.0 - 34	-
Farrington Sand	1956 - 1975	23	0 - 29.9	1.4	16	0.00 - 1.1	0.04	21	8.0 - 140	12
Brunswick Formation	1957 - 1973	16	0.02 - 5.0	0.16	16	0 - 0.55	0.03	20	82 - 1,620	227

BRUNSWICK FORMATION

The Triassic shales and sandstones of the Newark Group contain the most mineralized water in the study region. Generally the shales yield more mineralized water than the sandstones. A comparison was made between 18 chemical analyses of the 1941-48 period and 19 analyses of the 1957-73 period. No significant water quality trends were noted. Brunswick water is low in chloride, although it is a few mg/l higher than water from other formations. Chlorides commonly range from 10 to 40 mg/l. The highest chlorides were found in the Rahway area (83 and 210 mg/l) and near New Brunswick (88 mg/l). Sulfate is high locally, the highest value occurring in the Rahway region. This is apparently caused by concentrations of sulfate minerals (gypsum, barite, glauberite) near trap rock dikes. Nitrate concentrations are low to moderate, with the highest values found in the New Brunswick and South Plainfield region. The mean nitrate concentration is 10 mg/l. The amount of iron in water from the Brunswick Formation is usually low. Eleven out of 16 samples were below the 0.3 mg/l USPHS recommended limit. Highest iron concentrations were found in the vicinity of Rahway and near New Brunswick and Perth Amboy. Manganese levels are moderate to high, with 6 out of 10 samples at or over the 0.05 mg/l recommended USPHS limit. The common manganese range is 0.02 to 0.05 mg/l with a median of 0.03 mg/l.

The Brunswick Formation produces very hard water. Over half the samples contained greater than 180 mg/l hardness as $CaCO_3$; only three samples were less than 100 mg/l and the median was 227 mg/l. The total dissolved solids content is also high. The TDS content of 7out of 18 samples was over the 500 mg/l USPHS recommended limit, and the median

was 321 mg/l. The quality of Brunswick water varies greatly with locality and depth; better quality water is generally encountered near the surface than at greater depths. This is probably caused by better circulation of recharge water through permeable beds and fractures in the upper zone of the formation. The water is slightly alkaline, as indicated by the fact that 18 out of 21 samples had a pH equal to or greater than 7.2.

GROUND-WATER PUMPAGE

FARRINGTON SAND

Figure 6 shows annual average ground-water pumpage in mgd (million gallons per day) from the Farrington Sand south of the Raritan River between 1929 and 1974. A gradual decline in pumpage took place in the 1930 through 1933 period, probably reflecting a reduction in water demand that can be attributed in part to the economic depression of that time. From 1933 to 1936 pumpage from the Farrington increased sharply. In 1937, Barksdale [3] pointed to the possibility of salt-water encroachment into this aquifer in the Parlin area. As a result of his report and subsequent test drilling in 1937 and 1938 that confirmed the existence of a salt-water front in the Farrington Sand, water conservation measures were introduced at the Duhernal plants (E. I. duPont, Hercules, and National Lead), the major Farrington Sand pumpers at that time. The companies formed the Duhernal Water System which began operations in 1939, shifting a large amount of the ground-water pumpage from the Farrington Sand near Parlin to the Old Bridge Sand around Duhernal Lake. As a result, Farrington pumpage decreased during the period 1937 to 1943. However, since 1944 when pumpage amounted to 5

mgd, there has been a steady increase, and in 1974 nearly 18 mgd was withdrawn from the aquifer. Table 3 summarizes pumpage from the Farrington Sand for public supply, industrial, and agricultural uses for 1969 and 1974.

OLD BRIDGE SAND

Figure 7 shows annual average ground-water pumpage in mgd from the Old Bridge Sand between 1917 and 1974. After a high of approximately 11 mgd in 1918, associated with increased industrial pumpage related to World War I, a steady decline in pumpage from the Old Bridge occurred until 1932. From 1932 to 1935, pumpage rose slowly, but thereafter a sharp increase took place when the artificial recharge system of the Duhernal Water Company began functioning and the shift from Farrington to Old Bridge occurred. From 1942 to 1970, pumpage continued to increase, but not nearly as sharply as in the previous 10-year period. A peak pumpage of nearly 32 mgd was reached in 1970. It should be noted that the use of artificial recharge ponds on the outcrop area of the Old Bridge Sand increases the yield of the aquifer by over 24 mgd, and a significant percentage of Old Bridge pumpage is from recharged surface water. Table 3 summarizes pumpage from the Old Bridge Sand for public supply and industrial uses for 1969 and 1974.

NEWARK GROUP

In 1941, approximately 10 mgd was pumped from Triassic sandstones and shales belonging to the Newark Group. Table 3 shows the pumpage from the Newark Group for public supply and industrial uses for 1969 and 1974. In 1969 total pumpage averaged 29 mgd and by 1974

Table 3. Ground-Water Pumpage in Middlesex 208 Area, New Jersey, 1969 and 1974 (in million gallons daily).

Water Company	Old Bridge Sand		Farrington Sand		Undifferentiated Sand		Newark Group		Total	
	1969	1974	1969	1974	1969	1974	1969	1974	1969	1974
PUBLIC SUPPLY										
Cranbury Township	-	-	-	-	0.121	0.123	-	-	0.121	0.123
East Brunswick Water Dept.	-	-	1.935	2.068 [a]	-	-	-	-	1.935	2.068
Edison Township	-	-	-	-	-	-	0.002	0	0.002	0
Forsgate Farms	0.123	0.057	-	-	-	-	-	-	0.123	0.057
Forsgate Water Company	-	0.136	0.242	0.468	-	-	-	-	0.242	0.604
Helme Products, Inc.	-	-	-	-	0.026	0.025	-	-	0.026	0.025
Kingston Water Company	-	-	-	-	-	-	0.121	0.114	0.121	0.114
Madison Township M.U.A.	0.541	1.173	2.096	3.127	-	-	-	-	2.637	4.300
New Jersey Water Company Jamesburg District	0.424	0.430	-	-	-	-	-	-	0.424	0.430
Reliable Water Company Monroe Township M.U.A.	0.118	0.315	-	-	-	-	-	-	0.118	0.315
Sayreville Water Dept.	2.462	2.717	1.003	0.753	-	-	-	-	3.465	3.470
So. Brunswick M.U.A.	-	-	0.814	1.698	-	-	0.090	0.055	0.904	1.753
Middlesex Water Company	-	-	-	-	-	-	13.447	3.944	13.447	3.944
South River Borough	0.259	0.370	0.864	1.247	-	-	-	-	1.123	1.617
City of Perth Amboy	7.839	6.975	2.974	3.016	-	-	-	-	10.813	9.991
Borough of Spotswood	0.524	0.609	-	-	-	-	-	-	0.524	0.609
City of South Amboy	0.390	0.551	0.682	0.541	-	-	-	-	1.072	1.092
N.J. State Home for Boys	-	-	0.136	0.144	-	-	-	-	0.136	0.144
Bound Brook Water Company	-	-	-	-	-	-	0.037	0.031	0.037	0.031
Elizabethtown Water Company	-	-	-	-	-	-	12.827	15.018	12.827	15.018
Total:	12.680	13.333	10.746	13.062	0.147	0.148	26.524	19.162	50.097	45.705

a) Includes pumpage from stratified drift

Table 3 - (Continued)

Well Owner	Old Bridge Sand 1969	Old Bridge Sand 1974	Farrington Sand 1969	Farrington Sand 1974	Undifferentiated Sand 1969	Undifferentiated Sand 1974	Newark Group 1969	Newark Group 1974	Total 1969	Total 1974
					AGRICULTURAL					
Carter Wallace, Inc.	-	-	-	-	0.084	0.018	-	-	0.084	0.018
Edward Collins	-	-	0.003	0.019	-	-	-	-	0.003	0.019
LeRoy Dyal, Jr.	-	-	-	-	0.072	0.029	-	-	0.072	0.029
Peter A. Eonaitis	-	-	-	-	0.001	0.019	-	-	0.001	0.019
Joseph Konuk	-	-	0.031	0	-	-	-	-	0.031	0
Simonson Brothers	-	-	-	-	0.048	0.001	-	-	0.048	0.001
Lawrence J. Smith	-	-	0.004	0.005	-	-	-	-	0.004	0.005
Total:	-	-	0.038	0.024	0.205	0.067	-	-	0.243	0.091
					INDUSTRIAL					
Jersey Central Power & Light	-	-	0	0.045	-	-	-	-	0	0.045
Badische Products (BASF)	-	0.113	-	0.316	0.185	-	-	-	0.185	0.429
Chevron (California Oil)	-	-	0.322	0.345	-	-	-	-	0.322	0.345
Cities Service Research & Development	0.161	0.161	0.002	0.014	-	-	-	-	0.163	0.175
Cities Service Co.	-	-	-	-	-	-	0	0.212	0	0.212
Grefco Inc.	-	-	0.154	0.131	-	-	-	-	0.154	0.131
Princeton University Forrestal Campus	-	-	-	-	-	-	0.237	0.329	0.237	0.329
Kentile Inc.	-	-	-	-	-	-	0.203	0.215	0.203	0.215
Metuchen Golf & Tennis Club	-	-	-	-	-	-	0	0.021	0	0.021
Duhernal Water System	14.096	12.171	0.743	0.115	-	-	-	-	14.839	12.286
E. I. duPont	0.325	0.280	0.045	0.012	-	-	-	-	0.370	0.292
Hercules Powder Co.	-	-	0.022	0.006	-	-	-	-	0.022	0.006

b) 1969 based on 9 months record

Table 3 - (Continued)

Well Owner	Old Bridge Sand 1969	Old Bridge Sand 1974	Farrington Sand 1969	Farrington Sand 1974	Undifferentiated Sand 1969	Undifferentiated Sand 1974	Newark Group 1969	Newark Group 1974	Total 1969	Total 1974
				INDUSTRIAL (Continued)						
National Lead Co.	-	-	0.124	0.029	-	-	-	-	0.124	0.029
P. J. Schweitzer Co.	3.555	3.169	2.858	2.690	-	-	-	-	6.413	5.859
Anheuser Busch Co.	0.419	1.022	0.851	1.004	-	-	-	-	1.270	2.026
Air Products & Chemicals, Inc.	-	-	-	-	-	-	0.200	0.334	0.200	0.334
Berkely Sutton, Inc.	-	-	-	-	-	-	0	0.044	0	0.044
Herbert Sand Co.	-	-	-	-	0.128	0.108	-	-	0.128	0.108
Mideast Anodizing Corp.	-	-	0.104	0.029	-	-	-	-	0.104	0.029
Pingley Rubber Co.	-	-	-	-	-	-	0.053	0.074	0.053	0.074
Union Carbide Corp.	-	-	0.104	0.103	-	-	-	-	0.104	0.103
S. Bamberger Co.	-	-	-	-	-	-	0.100	0.080	0.100	0.080
Carter Wallace Inc.	-	-	-	-	0	0.311	-	-	0	0.311
General Aniline & Film Corp.	-	-	-	-	-	-	0.233	0.238	0.233	0.238
Kerr Glass Mfg. Corp.	-	-	-	-	0.052	0.099	-	-	0.052	0.099
Muhlenberg Hospital	-	-	-	-	-	-	0.123	0.145	0.123	0.145
N.J.E. Corp.	-	-	-	-	0	0.109	-	-	0	0.109
National Starch & Chem. Corp.	-	-	-	-	-	-	0.888	1.104	0.888	1.104
Wigton Abbott Corp.	-	-	-	-	-	-	0.035	0.026	0.035	0.026
Total:	18.556	16.916	5.329	4.839	0.365	0.627	2.072	2.822	26.322	25.204
Grand Total:	31.236	30.249	16.113	17.925	0.717	0.842	28.596	21.984	76.662	71.000

	1969	1974
Total Coastal Plain	48.066	49.016
Total Triassic and drift	28.596	21.984

this had declined to 22 mgd, mostly due to the fact that the Middlesex Water Company began using more surface water and less ground water. Over 80 percent of the water withdrawn in the study area in 1974 was pumped by the Elizabethtown and Middlesex Water Companies.

SUMMARY

In 1974, total reported ground-water pumpage was 71 mgd, of which 49 mgd or 69 percent was withdrawn from Coastal Plain aquifers and nearly 22 mgd or 31 percent came from the Triassic Newark Group and some stratified drift. Public supply use accounted for nearly 46 mgd (nearly 65 percent) of the total volume of water pumped, while industrial pumpage amounted to 25 mgd (35 percent), and agricultural pumpage was less than 0.1 mgd (less than one percent).

ARTIFICIAL RECHARGE OPERATIONS

The history of artificial recharge dates back to World War I when several ponds were excavated in the Old Bridge Sand near the Perth Amboy pumping station. Water from Deep Run was diverted to these ponds to supplement the flow of Tennent Brook and Runyon Pond. Computation of flow, evaporation and changes in ground-water storage indicated that the 32-acre Runyon Pond provided average recharge to the aquifer of about 76,000 gpd (gallons per day) per acre. [1] The maximum rate of recharge from the pond was estimated to be more than 5 mgd. A new 100-acre recharge pond on Deep Run is now planned. This pond should provide an additional 7 mgd of recharge to the Perth Amboy water system.

the combined total of many small leaks may have a significant impact on ground-water quality.

Many of the major sewer systems in the older urbanized areas were constructed early in this century and some of these pipes are still in use. Joints in the older gravity sewer systems where shorter pipe lengths were used may number as many as 1,000-2,000 per mile, and are prone to leak more than newer, longer sewer pipes having fewer joints. Where the joints were secured by mortar, as they generally were in the sewers constructed more than 40 years ago, there are a number of opportunities for joint deterioration and significant leakage.

Over the years, sewer construction materials and methods have improved significantly. Jointing materials have changed from cement mortar to asphaltic and similar special compounds, essentially watertight rubber or plastic O-rings, and heat shrinkage joint covers. Therefore, the newer sewer systems are generally expected to have little if any leakage, and relatively little impact on ground-water quality. For example, the specifications which are currently being followed call for leakage to be less than 30 gpd per mile per inch of pipe diameter.

Lagoons

Fewer than 20 liquid waste lagoons were located in the study area. These were either found at locations beyond the limits of the central sewer system or were used for disposal of liquid products which could not be discharged into the central system without prior treatment.

Several investigators have calculated water seepage rates from waste-water lagoons; [22] an average rate from these reports is approximately 30 inches/year. One investigator reports that this rate may vary by as much as a factor of ten, depending on local surface conditions, the ability of surface impoundments to seal themselves, and the amount of leakage that takes place before the sealing is fully effective. However, for a general estimate, based on 30 inches/year, leakage appears to be approximately six percent of the total volume of waste water entering the lagoon.

CASE HISTORIES

Because of the lack of base line ground-water quality data, there is no way at this time to determine the full significance of these pollution sources as they may affect the quality of ground water on a regional basis. However, information is available from several case histories which illustrate some of the problems that are associated with these practices elsewhere.

Brooklyn, New York

In a 1968 report, the U.S. Geological Survey concluded that leaky sanitary sewers were essentially responsible for the elevated nitrate levels in Brooklyn ground water. [23] In this report, the Survey points out that the sewer system is quite old, with major sections dating back to the turn of the century. Portions were constructed of brick and mortar, and these sections are judged to be highly susceptible to leaching and substantial deterioration. It is noted that although the recharge surfaces have been largely paved over in the county,

Plate I. PRE-QUATERNARY GEOLOGY AND LINES OF SECTIONS

This map shows the outcrop pattern of the geologic units with the Quaternary age formations removed and the lines of six hydrogeologic sections constructed to illustrate subsurface conditions. During Quaternary time much of the study area was blanketed with glacial deposits and stream alluvium, obscuring the stratigraphic relationships of the underlying formations. On this map the Quaternary (Pleistocene and Recent deposits) are not shown so that the areal distribution and stratigraphic relations of the underlying formations can be better understood.

The study area lies within two major physiographic provinces, the Triassic Lowland and the Coastal Plain. The heavy dashed line that roughly bisects the county and runs from southwest to northeast along Devils Brook, Farrington Lake, and Route 1 north of the Raritan River is known as the Fall Line and represents the northern and landward limit of the Coastal Plain physiographic province. The region north of this line is part of the Triassic Lowland province.

The Triassic Lowland is underlain by bedrock of Triassic age called the Newark Group. Included in this group are the Brunswick, Lockatong, and Stockton Formations consisting of shale, argillite, and sandstone, respectively. Also included within this group are igneous basalt flows of the Watchung Mountains and diabase intrusions.

The Newark Group continues southeast of the Fall Line, but is covered by a thick sequence of Coastal Plain deposits and so is not shown on the map. The Coastal Plain is underlain by a southeasterly dipping and thickening sequence of unconsolidated sand, gravel, clay,

and silt of Cretaceous age. Each Coastal Plain formation shown has a southwest to northeast strike and dips to the southeast. Moving downdip across the Coastal Plain from the Fall Line, the outcrop belts of successively younger geologic formations are crossed. This means that as each formation becomes overlain by younger and younger formations, it lies at progressively greater depths below land surface. For instance, the Old Bridge Sand (part of the Raritan Formation) crops out near Duhernal Lake, but about four miles to the southeast near the county border, the Old Bridge Sand is overlain by four younger formations.

Northwest of the Fall Line are three outliers of undifferentiated Raritan sediments which probably represent erosional remnants of a formerly more extensive Coastal Plain.

The geologic units shown on Plate 1 were taken from the State of New Jersey's Bureau of Geology and Topography geologic overlay sheets 25, 26, 28 and 29, Special Report 8 [1] and the Geologic Map of New Jersey. [8]

Plates 2-7. HYDROGEOLOGIC CROSS SECTIONS I-VI.

Plates 2 through 7 (cross sections I through VI) show the subsurface geologic units beneath the Coastal Plain and their stratigraphic relationships. Sections I through V are roughly parallel to the dip of the unconsolidated formations and run from northwest to southeast while Section VI runs along the strike of the formations from southwest to northeast. The elevation of the bedrock floor deepens in a southeasterly direction with a corresponding thickening of the sequence of unconsolidated sediments that rest on this surface. As the outcrop areas of successively younger formations are crossed in a downdip direction, the upper surface of each formation lies at a progressively greater depth. The dip of the unconsolidated formations and bedrock appear considerably steeper than they actually are because the scales chosen for the sections result in a vertical exaggeration of 40 times. Formations of Precambrian, Triassic, Upper Cretaceous, Pleistocene, and Recent age existing in the study area are represented on the cross sections.

There are three major types of bedrock shown on the cross sections which are from oldest to youngest: Precambrian crystalline rocks, the Newark Group of Triassic age, and a diabase sill or dike also of Triassic age. These rocks are relatively unimportant in the coastal region as sources of ground water because they are usually overlain by more prolific aquifers. However, in the Triassic Lowland area to the northwest, the Newark Group is a major source of ground water.

Resting directly on the bedrock in the Coastal Plain region is the Raritan Formation of

Upper Cretaceous age (Sections I through VI). The basal member of this formation, the Raritan Fire Clay, is a weathering product of the Triassic shale and as such is confined mainly to areas underlain by shale, although some material may have washed onto the Precambrian surface to the southeast. Undoubtedly much of the bedrock surface is covered by a clayey material which is a weathering product of the underlying rock. Above the fire clay are the two most productive aquifers in the study area, the Farrington and Old Bridge Sands. As can be seen on the cross sections, both these units are continuous beneath the Coastal Plain southeast of their respective outcrop areas. The Woodbridge Clay is also persistent throughout the subsurface in the Coastal Plain and is the main confining unit separating the Farrington and Old Bridge Sands. The Sayreville Sand and South Amboy Fire Clay, which occur stratigraphically between the Woodbridge Clay and Old Bridge Sand are, however, thin and discontinuous and are absent in Sections III and V. Only in Section I do the two formations extend for any considerable distance. Due to limited occurrence and fine-grained nature, the Sayreville Sand has a very small potential for water-supply development. Northeast of Spotswood the individual members of the Raritan Formation, in particular, the Farrington and Old Bridge Sands and Woodbridge Clay, are distinguishable in well logs as they retain their outcrop type lithologies. However, in the Jamesburg area the Woodbridge Clay appears to contain a larger proportion of sand and the clay is lenticular rather than a continuous sheet. This makes separation of the Farrington and Old Bridge into distinct units somewhat difficult. For continuity, the names Farrington and Old Bridge are extended to the county line, although further southwest this distinction may no longer be possible.

The Amboy Stoneware Clay, which previously had been considered to be the upper unit of the Raritan Formation, is now interpreted as being the basal member of the Magothy Formation ?) and is so indicated on the cross sections. The formations above the Raritan (i.e. Magothy, Merchantville, etc.) have little importance as major water producers in the study area. The Magothy, Merchantville, Woodbury, and Marshalltown Formations are chiefly clays, silts, and fine-grained sands with little capacity to transmit or yield useable quantities of water. The Englishtown Formation and Wenonah Sand are relatively permeable units, but have limited occurrence in Middlesex County. The Pleistocene units are quite permeable in places, but their limited thickness in most areas prevents them from being major aquifers.

As indicated by Sections I and II, a buried diabase ridge lies beneath the Raritan River between Sayreville and Perth Amboy. This ridge stood as a topographic high during Upper Cretaceous time and had a strong effect on Farrington sedimentation. In many places along the axis of the ridge the sand was either thinly deposited or not deposited at all. In addition, during Pleistocene time when sea level was at a lower elevation than at present, the Raritan River cut a channel nearly or completely to bedrock along its lower reaches. This erosional activity removed the thinly deposited Farrington Sand in places and replaced it with Pleistocene and Recent deposits. The net result is that in many places beneath the Raritan River there is no Farrington Sand, and at other spots (Sections I and II), the sand is only a thin deposit on the diabase ridge. In the area of the Washington Canal on Cross Section II, it can be seen that the Woodbridge Clay was either not deposited or later eroded and replaced by Pleistocene de-

posits which directly overlie the Farrington Sand. Originally, relatively impermeable Recent deposits blanketed the Pleistocene materials, but dredging of the Washington Canal exposed the permeable Pleistocene materials directly to the brackish water in the canal and provided an easy route for brackish water to eventually move downward into the Farrington Sand. In the southern part of the study area near Jamesburg and especially along the Millstone River at the county border, erosional and depositional activity during Pleistocene time has removed considerable amounts of the Upper Cretaceous material, replacing it with Pleistocene sand, gravel and clay deposits up to 100 feet thick.

On each of the sections, the potentiometric surface of the Farrington Sand is shown. The depressions in the Farrington water-level surface on Sections I through III are the result of heavy pumping from the sand in this area. Section VI shows the area southwest of Jamesburg to be only slightly affected by this pumping, and Sections IV and V support this conclusion. On Section VI, northeast of Spotswood, two major depressions in the water-level surface of the Farrington Sand can be seen between Runyon and South Amboy again corresponding to areas of heavy pumping.

The hydrogeologic sections were based on geologists' logs, interpretations of drillers' logs, geologic maps, and geophysical logs obtained from the files and reports of the New Jersey Bureau of Topography and Geology, and the U. S. Geological Survey. The potentiometric surface of the Farrington Sand was determined from data supplied by the U. S. Geological Survey and represents field measurements taken in the fall of 1973. Topography was taken from the U. S. Geological Survey's 7 1/2 minute quadrangles. Many well logs exist in the Coastal Plain region of Middlesex County, but more deep test wells are needed in the southeastern part of the study area to better define the geology.

Plate 8. CONTOURS ON UPPER SURFACE OF BEDROCK BENEATH COASTAL PLAIN.

This map shows the various types of bedrock present in the study area and the elevation of the bedrock surface below the Coastal Plain deposits

The heavy dashed line is the Fall Line which separates two distinct physiographic divisions. North of the Fall Line is the Triassic Lowland Province and south of the line begins the Coastal Plain Province. The Triassic Lowland is underlain by sedimentary and igneous rocks of Triassic age. The Triassic sedimentary rocks have been covered by lava flows and intruded by igneous rocks in several places. The Watchung Mountains, present along the northern boundary of the study region, represent former lava flows and a diabase intrusion (extension of the Palisades Sill) passes through the entire region. Within the 208 study area this diabase or trap rock appears at the surface in the Princeton-Lawrence Brook region and at Carteret but in between these two outcrops it is buried by younger Coastal Plain and Pleistocene deposits. Sedimentary rocks of Triassic age continue southward below the Coastal Plain cover, roughly to a line running through Jamesburg-Runyon-South Amboy. East of this line the bedrock consists of crystalline rock (gneiss and schist) of Precambrian age. Buried geologic contacts are shown as broken lines on the map.

The elevation with reference to mean sea level of the bedrock surface beneath the Coastal Plain is shown by contour lines. As indicated, the bedrock surface ranges from about 50 feet above sea level near the Fall Line to about 500 feet below sea level along the Middlesex-Monmouth County border. The bedrock surface dips in a southeasterly direction at the rate of about 55 feet per mile. Depth to bedrock is greatest east of Jamesburg along the Middlesex-

Monmouth County line. In this area, land elevation range between 50 and 100 feet and the crystalline bedrock would be at a depth of 550 to 600 feet below land surface.

Bedrock outcrop data were obtained from published geologic maps. Subcrops (buried bedrock) were determined from well logs. Information on the subcrop of the Palisades Sill was obtained from unpublished work at the New Jersey Bureau of Geology and Topography. [10] Over the entire map area some 137 control points were used to draw the contour lines.

The control points indicating the bedrock surface are not evenly distributed over the study area and undoubtedly the actual bedrock surface is much more uneven. This is shown by the many control points and elevations on the subcrop of the diabase sill in the Sayreville area. The upper surface of the sill is quite irregular with variations in elevation of the rock surface of 50 feet over short distances.

Table 1 - (Continued)

System	Unit	Lithologic description	Thickness (feet)	Water-bearing characteristics
	Magothy Formation	Fine lignitic sand and black clay	90 - 130	Not important as aquifer. Well y are low but sufficient for domestic purposes.
	Amboy Stoneware Clay	Gray to black clay with carbonaceous material	0 - 30	Considered to be lower facies of M thy Formation. Confining bed.
Cretaceous	Old Bridge Sand	Fine- to coarse-grained white to yellow sand	20 - 110	Major aquifer tapped by many wel Median specific capacity is 20 gp. Transmissivity range 140,000 to 230,000 gpd/ft. Artificially rech in places. Well yields 200 to 1,C gpm.
	South Amboy Fire Clay	Varicolored clay	0 - 35	Confining bed.
	Sayreville Sand	Fine, white micaceous sand	0 - 40	Not continuous. Unimportant as aquifer.
	Woodbridge Clay	Gray clay and clayey sand	50 - 100	Major confining bed overlying Far rington Sand.
	Farrington Sand	Gray to yellow fine- to medium-grained sand. Contains some clay layers.	30 - 150	Major aquifer tapped by many we Median specific capacity is 29 gpr Transmissivity range 50,000 to 150,000 gpd/ft. Well yields 500 2,000 gpm.
	Raritan Fire Clay	Varicolored basal clay	0 - 90	Confining bed.
Triassic	[redacted] Newark Group	Red shale interbedded with siltstone and sandstone	5,000+	Major aquifer north of Raritan Riv Specific capacity is 0.1 to 25 gpm Transmissivity range 1,000 to 4, gpd/ft. Well yields 50 to 700 gp
	Lockatong Formation	Hard shale and argillite	1,000+	Present only in small areas. Of little importance as aquifers.
	Stockton Formation	Conglomerate and sandstone	1,000+	

PRE-QUATERNARY GEOLOGY AND LINES OF SECTION

MIDDLESEX 208

LEGEND

CRETACEOUS	Kmw	MOUNT LAUREL AND WENONAH SANDS
	Kml	MARSHALLTOWN FORMATION
	Ke	ENGLISHTOWN SAND
	Kwb	WOODBURY CLAY
	Kmv	MERCHANTVILLE CLAY
	Km	MARLBOROTHY
	Kob	OLD BRIDGE SAND
	Kf	FARRINGTON SAND
	Kru	RARITAN FORMATION UNDIVIDED
TRIASSIC	Trb	BRUNSWICK SHALE
	Trl	LOCKATONG FORMATION
	Trs	STOCKTON FORMATION
	Trdb	DIABASE
	Trbs	BASALT

NEWARK GROUP

BOUNDARY OF PROJ

II —— II LINE OF HYDROGEOL (SEE PLATES 2 THR

FALL LINE

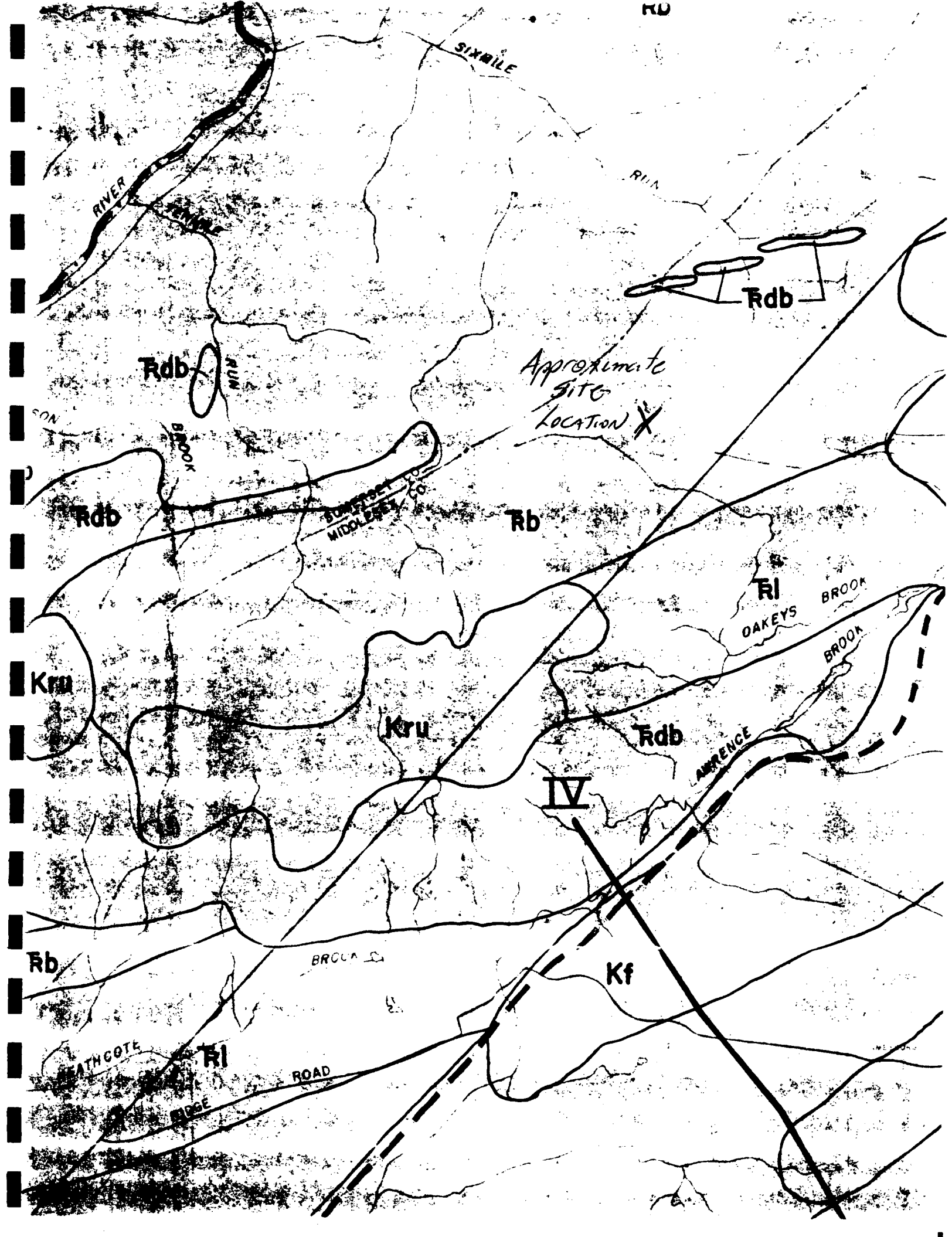
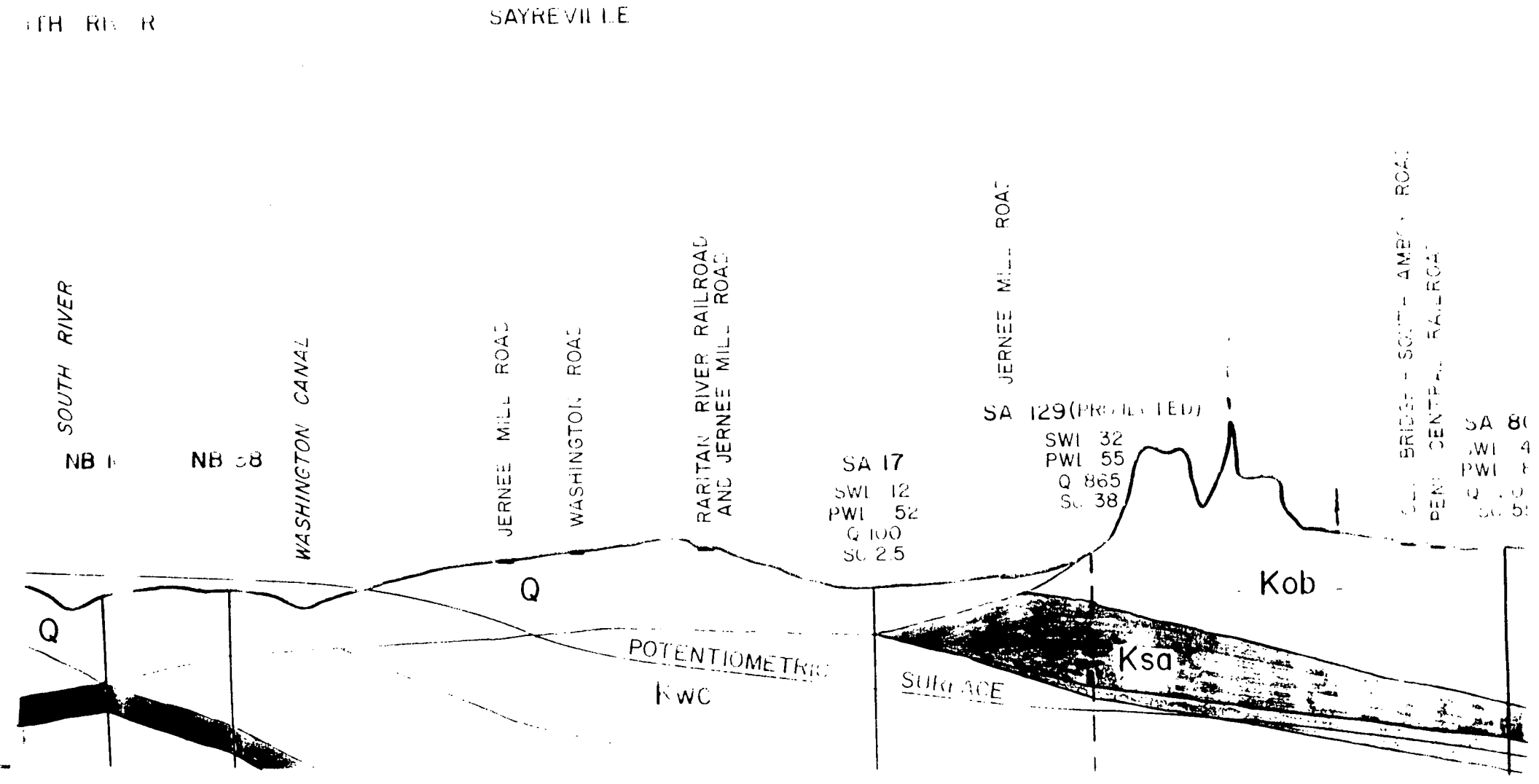

RD
SIX MILE
RIVER
RUN
Rdb
Rdb
RUN
Approximate
Site
Location
BROOK
Rdb
SOMERSET
MIDDLESEX Co.
Rb
Rl
OAKEYS
BROOK
BROOK
Kru
Kru
Rdb
ABERENCE
IV
Rb
BROOK
Kf
Rl
ROAD
BRIDGE

PLATE 3

HYDROGEOLOGIC SECTION II



EXPLANATION OF ABREVIATIONS

[illegible]	[illegible]	
Kpl	PLEISTOCENE SAND	
Kwl	WOODBURY CLAY	
Km	MERCHANTVILLE CLAY	
Kg	MAGOTHY FORMATION	
Kas	AMBOY STONEWARE CLAY	
Kob	OLD BRIDGE SAND	RARITAN FM
Ksw	SOUTH AMBOY FIRE CLAY	RARITAN FM
Ks	SAYREVILLE SAND	RARITAN FM
Kw	WOODBRIDGE CLAY	RARITAN FM
Kf	FARRINGTON SAND	RARITAN FM
Kfc	FOSSIL M FIRE CLAY	RARITAN FM
Rb	BRUNSWICK SHALE	NEWARK GROUP Rn
Rl	LOCKATONG FORMATION	NEWARK GROUP Rn
Rs	STOCKTON FORMATION	NEWARK GROUP Rn
Rn	UNDIFF.	NEWARK GROUP Rn
[illegible]	PRECAMBRIAN GNEISS AND SCHIST	

HORIZONTAL SCALE 1" = 2000 FEET
VERTICAL SCALE 1" = 50 FEET
EXAGGERATION = 40

LOCATION OF SECTION SHOWN ON PLATE 1

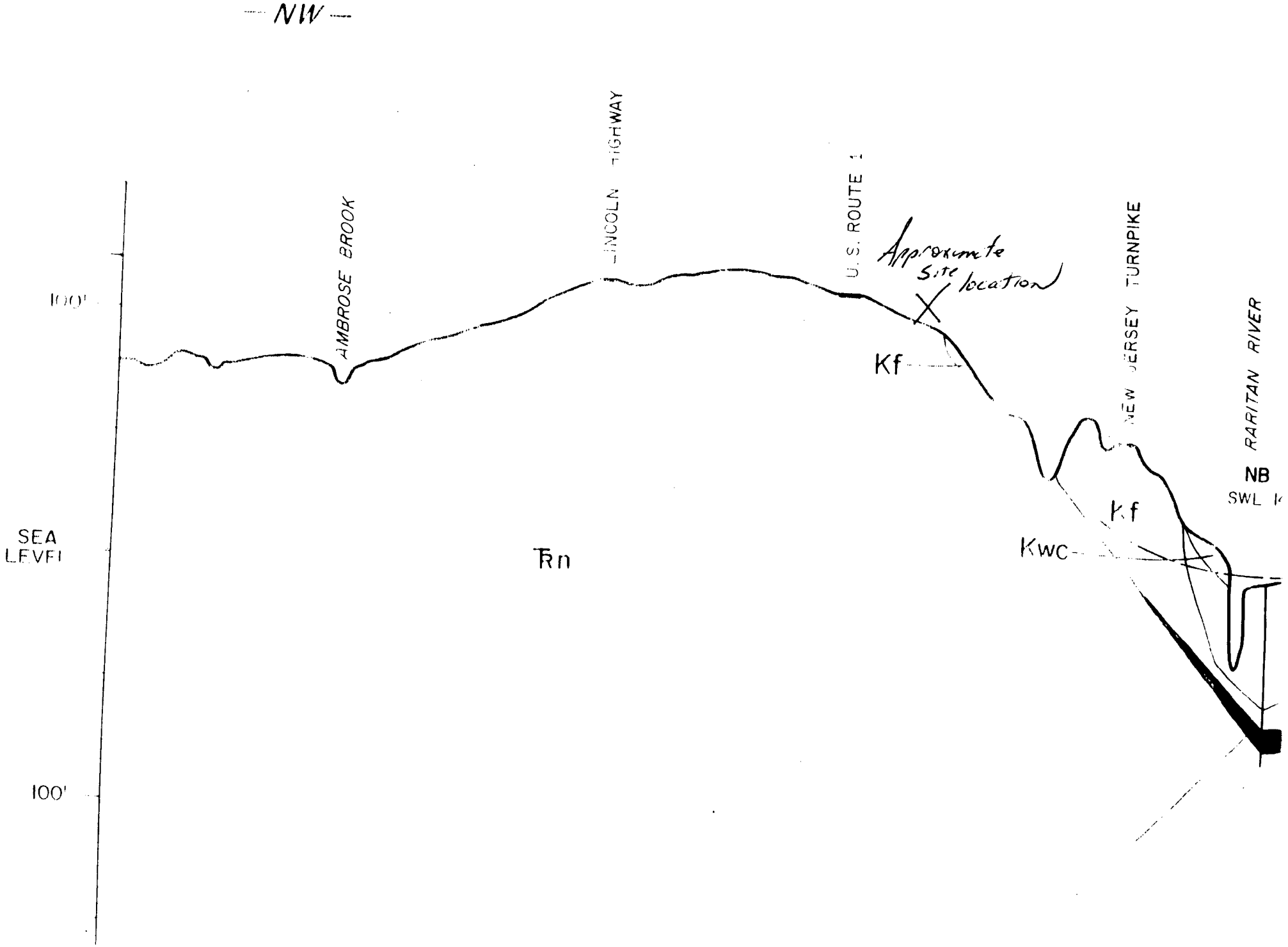

NW
AMBROSE BROOK
LINCOLN HIGHWAY
U.S. ROUTE 1
Approximate Site location
NEW JERSEY TURNPIKE
RARITAN RIVER
NB
SWL
100'
SEA LEVEL
100'
Kf
Kwc
Kf
Trn

Table 1 - Geologic Units and Their Ground-Water Potential in the Middlesex 208 Area.

System	Unit	Lithologic description	Thickness (feet)	Water-bearing characteristics
Quaternary	Alluvium	Silt, sand and mud	0 - 50	Relatively impermeable; no importance as source of water.
	Eolian deposits	Sand dunes	0 - 40	Of no importance as source of water as mostly unsaturated.
	Stratified drift	Sand, gravel	0 - 60	Permeable and locally an important water source north of Raritan River.
	Non-stratified drift (till)	Clay, boulders, gravel, sand, silt	0 - 150	Of no importance as source of water. Absorbs precipitation and supplies recharge to underlying Triassic aquif
	Cape May Formation	Fine- to medium-grained quartz sand and some fine gravel	0 - 50	May fill pre-Cape May stream channels and overlies portions of Triassic and Old Bridge aquifers. Locally exploited for domestic wells.
	Pensauken Formation	Clayey sand and gravel	0 - 70	Overlies portions of coastal plain and Triassic aquifers. Locally tappe by domestic wells that yield 50 to 100 gpm.
Cretaceous	Mount Laurel and Wenonah Sands	Micaceous sand	50	Lower portion of sand crops out along southern Middlesex County border. Locally important aquifer.
	Marshalltown Formation	Micaceous, sandy clay	40	Confining bed.
	Englishtown Sand	Micaceous, fine- to medium-grained sand, some clay lenses	100	Present in limited area along southeastern Middlesex. Locally importar as water source. Presently not developed.
	Woodbury Clay	Black, micaceous clay	50	Major confining zone to underlying aquifers.
	Merchantville Clay	Black, micaceous clay with glauconite	50 - 60	

Table 1 - (Continued)

System	Unit	Lithologic description	Thickness (feet)	Water-bearing characteristics
Cretaceous	Magothy Formation	Fine lignitic sand and black clay	90 - 130	Not important as aquifer. Well yiel are low but sufficient for domestic purposes.
	Amboy Stoneware Clay	Gray to black clay with carbonaceous material	0 - 30	Considered to be lower facies of Mag thy Formation. Confining bed.
	Old Bridge Sand	Fine- to coarse-grained white to yellow sand	20 - 110	Major aquifer tapped by many wells. Median specific capacity is 20 gpm/ Transmissivity range 140,000 to 230,000 gpd/ft. Artificially recharg in places. Well yields 200 to 1,000 gpm.
	South Amboy Fire Clay	Varicolored clay	0 - 35	Confining bed.
	Sayreville Sand	Fine, white micaceous sand	0 - 40	Not continuous. Unimportant as aquifer.
	Woodbridge Clay	Gray clay and clayey sand	50 - 100	Major confining bed overlying Far- rington Sand.
	Farrington Sand	Gray to yellow fine- to medium-grained sand. Contains some clay layers.	30 - 150	Major aquifer tapped by many wells. Median specific capacity is 29 gpm/ Transmissivity range. 50,000 to 150,000 gpd/ft. Well yields 500 to 2,000 gpm.
	Raritan Fire Clay	Varicolored basal clay	0 - 90	Confining bed.
Triassic	Brunswick Formation (Newark Group)	Red shale interbedded with siltstone and sand-stone	5,000+	Major aquifer north of Raritan River Specific capacity is 0.1 to 25 gpm/ Transmissivity range 1,000 to 4,0 gpd/ft. Well yields 50 to 700 gpm
	Lockatong Formation (Newark Group)	Hard shale and argillite	1,000+	Present only in small areas. Of little importance as aquifers.
	Stockton Formation (Newark Group)	Conglomerate and sandstone	1,000+	

REFERENCE NO. 15

23.41.7 [illegible]

[illegible] CONSERVATION — Permit No. 28-2691
[illegible] DEVELOPMENT — Application No. ____
DIVISION OF WATER POLICY & SUPPLY — County ____

[illegible]

1. OWNER [illegible] Co. ADDRESS PO. Box 505, Franklin Park, N.J.

Owner's Well No. 4 SURFACE ELEVATION ____ Feet (Above mean sea level)

2. LOCATION South Brunswick Twp near Franklin Park Middlesex Co. N.J.

3. DATE COMPLETED Aug 8, 1957 DRILLER [illegible] Co. Inc.

4. DIAMETER: Top 10 inches Bottom 10 inches TOTAL DEPTH [illegible] feet

5. CASING: Type drive pipe Diameter 10 inches Length 49 feet

6. SCREEN: Type ____ Size of Opening ____ Diameter ____ inches Length ____ feet

Range { Top ____ feet / Bottom ____ feet } Geologic Formation Trias-shale

Tail piece: Diameter ____ inches Length ____ feet

7. WELL FLOWS NATURALLY ____ Gallons per Minute at ____ Feet above surface

Water rises to ____ Feet above surface

8. RECORD OF TEST: Date [illegible] /57 Yield 246 Gallons per minute

Static water level before pumping 21 Feet below surface

Pumping level 172 feet below surface after 28 hours pumping

Drawdown 161 Feet Specific Capacity ____ Gals. per min. per ft. of drawdown

How Pumped turbine How measured Orifice

Observed effect on nearby wells none

9. PERMANENT PUMPING EQUIPMENT:

Type ? Mfrs. Name ____

Capacity ____ G.P.M. How Driven ____ H.P. ____ R.P.M. ____

Depth of Pump in well ____ Feet ____ Depth of Footpiece in well ____ Feet

Depth of Air Line in well ____ Feet ____ Depth of Water on Pump ____

10. USED FOR Public Supply AMOUNT Average ____ Gallons Daily

Maximum ____ Gallons Daily

11. QUALITY OF WATER ____ Sample: Yes ____ No ____

Taste none Odor none Color clear Temp. ____ °F

12. LOG See other side Are samples available [illegible]

(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)

13. SOURCE OF DATA Well Statement.

14. DATA OBTAINED BY W. J. [illegible] Date August [illegible]

[illegible]

Record of well

10" well

Drilled 10" hole to [illegible]

10" drive pipe and cemented [illegible]

in the rock and drilled 10" hole [illegible]

Formation

0' - 6' [illegible]

6' - 100' red rock

100' - 115' gray rock

115' - 390' red rock

390' - 425' gray rock

425' - 445' red rock

Struck water 100' to 200' & 390'

Test on well with turbine pump 200' setting

flow 246 GPM drawdown 172' from surface after

22 hours continuous test.

Static water level 21' from the surface.

Well drilled June 26-Aug 6, 1957

FORM 87

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES

Permit No. 28-7845
Application No. _____
County _____

WELL RECORD

1. OWNER Franklin House Bldg. Corp. ADDRESS 925 Clifton Ave., Clifton, N. J.
Owner's Well No. _____ SURFACE ELEVATION _____ Feet (Above mean sea level)
2. LOCATION Kendall Pk. area, Franklin Township, Somerset County, N. J.
3. DATE COMPLETED April 13, 1973 DRILLER Wm. Stothoff Co., Inc.
4. DIAMETER: top 8" Inches Bottom 8 Inches TOTAL DEPTH 279 Feet
5. CASING: Type Steel Pipe Diameter 8 Inches Length 52 Feet
6. SCREEN: Type _____ Size of Opening ___ Diameter _____ Inches Length _____ Feet
Range in Depth { Top _____ Feet / Bottom _____ Feet Geologic Formation _____
Tail piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date April 13, 1973 Yield 100 Gallons per minute
Static water level before pumping 45' Feet below surface
Pumping level _____ feet below surface after _____ hours pumping
Drawdown _____ Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How Pumped Air How measured 5 gal. pail
Observed effect on nearby wells none
9. PERMANENT PUMPING EQUIPMENT:
Type _____ Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well _____ Feet Type of Meter on Pump _____ Size ___ Inches
10. USED FOR Domestic AMOUNT { Average _____ Gallons Daily / Maximum _____ Gallons Daily
11. QUALITY OF WATER Unknown Sample: Yes ___ No. x
Taste _____ Odor _____ Color _____ Temp. _____ °F
12. LOG 0-297 Shale Are samples available? no
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Wm. Stothoff Co., Inc.
14. DATA OBTAINED BY " " " " Date April 16, 1973

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

rev 67

JCM

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

Permit No. 28-4479
Application No. _____
County _____

WELL RECORD

1. OWNER St Augustine's School ADDRESS Franklin Park, N.J.
Owner's Well No. 1 SURFACE ELEVATION _____ Feet (Above mean sea level)
2. LOCATION ~~Bpty~~ South Brunswick Twp. Middlesex Co. N.J.
3. DATE COMPLETED July 27,1962 DRILLER Wm. Stothoff Co. Inc.
4. DIAMETER: top 8 Inches Bottom 8 Inches TOTAL DEPTH 300 Feet
5. CASING: Type Drive pipe Diameter 6 Inches Length 42'2" Feet
6. SCREEN: Type _____ Size of Opening ___ Diameter _____ Inches Length _____ Feet
Range in Depth { Top _____ Feet / Bottom _____ Feet Geologic Formation _____
Tail piece: Diameter _____ Inches Length _____ Feet
7. WELL FLOWS NATURALLY _____ Gallons per Minute at _____ Feet above surface
Water rises to _____ Feet above surface
8. RECORD OF TEST: Date July 26,1962 Yield 100 Gallons per minute
Static water level before pumping 0 Feet below surface
Pumping level 56 feet below surface after 8 hours pumping
Drawdown 56 Feet Specific Capacity _____ Gals. per min. per ft. of drawdown
How Pumped Plunger pump How measured 55 gal bbl
Observed effect on nearby wells _____
9. PERMANENT PUMPING EQUIPMENT:
Type ? Mfrs. Name _____
Capacity _____ G.P.M. How Driven _____ H.P. _____ R.P.M. _____
Depth of Pump in well _____ Feet Depth of Footpiece in well _____ Feet
Depth of Air Line in well ____ Feet Type of Meter on Pump _____ Size ___ Inches
10. USED FOR Domestic service AMOUNT { Average _____ Gallons Daily / Maximum _____ Gallons Daily
11. QUALITY OF WATER _____ Sample: Yes ____ No. ____
Taste none Odor none Color clear Temp. _____ °F
12. LOG See other side Are samples available? No
(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA Well Statement.
14. DATA OBTAINED BY H.J.Stothoff Date Aug 6,1962

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

C. Brun. (97)

Record of well
8" well 300' deep
Drilled 12" hole 42' and cased out with 42'2" - 8" drive pipe and cemented the pipe tight in the rock. Drilled 8" hole on in the rock.
Formation
0' - 4' earth & clay
4' - 210 red shale
210- 300 Blue blaked shale
Test on well with 150' - 5" test pump flow 100 GPM drawdown 56' from the surface
Static water level at surface
Well drilled July 6-27,1962

REFERENCE NO. 16

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Policies and Practices for Managing Middlesex County's Groundwater Resources

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middlesex county planning board, n.j.

POLICIES AND PRACTICES FOR MANAGING MIDDLESEX COUNTY'S GROUNDWATER RESOURCES

PREPARED BY THE
ENVIRONMENTAL SYSTEMS SECTION
MIDDLESEX COUNTY PLANNING BOARD
NEW BRUNSWICK, N.J.
SEPTEMBER 1974

TEXT REVISED AND REPRINTED
JANUARY 1979

Thomas J. Molyneux, Director
Stephen J. Capestro
David B. Crabiel
Frank Pelly
John A. Phillips
Dorothy K. Power
John A. Smith

Middlesex County
Board of Chosen Freeholders

Middlesex County
Planning Board

Hyman Center, Chairman
Thomas J. Molyneux, Freeholder-Director
Stephen J. Capestro, Freeholder
John Bernat, Jr.
Dennis Cremins
John J. Reiser, County Engineer
Sidney Sewitch, Vice Chairman
Walter Wilson

Douglas S. Powell
Frank J. Rubin, Counsel
Patricia Lycosky, Secretary

ACKNOWLEDGEMENT

Many people have contributed their time and expertise during this study. The Middlesex County Water Supply Advisory Committee provided support and encouragement for the study and several members of the Committee provided data and information. Mr. Joseph Miller and Mr. Daniel Dombroski, Jr., of the N.J. Department of Environmental Protection - Bureau of Geology and Topography provided information on specific well locations and Mr. Raymond Webster of the NJDEP - Bureau of Water Allocating provided data on groundwater withdrawals in the County. Mr. William Kann and Mr. George Farlekas of the United State Geological Survey provided useful water quality data and geophysical logs during the early stages of this study. We are thankful of these gentlemen for their cooperation and assistance.

The members of the Middlesex County Water Supply Advisory Committee provided significant advice and assistance during the preparation of this study and reviewed the final report.

At its meeting of November 21, 1974 the Committee unanimously adopted a motion approving and accepting this study and directed that it be forwarded to the Middlesex County Planning Board for its consideration.

Middlesex County
Water Supply Advisory Committee

Mr. Elmer Dieker, Chairman
Mr. Edward Bastian -Middlesex Water Company
Mr. Thomas Cawley - Elizabethtown Water Company
Mr. Martin E. Langenohl - Perth Amboy Water Department
General William Whipple - Water Resources Research Institute - Rutgers Univ.
Mr. Alvin Zach - Newark Department of Engineering
Mr. Robert Frisch - Attorney
Mr. Russell Fleming - Attorney
Mr. John Marshall - Duhernal Water Company
Mr. Donald Carey - New Brunswick Water Department

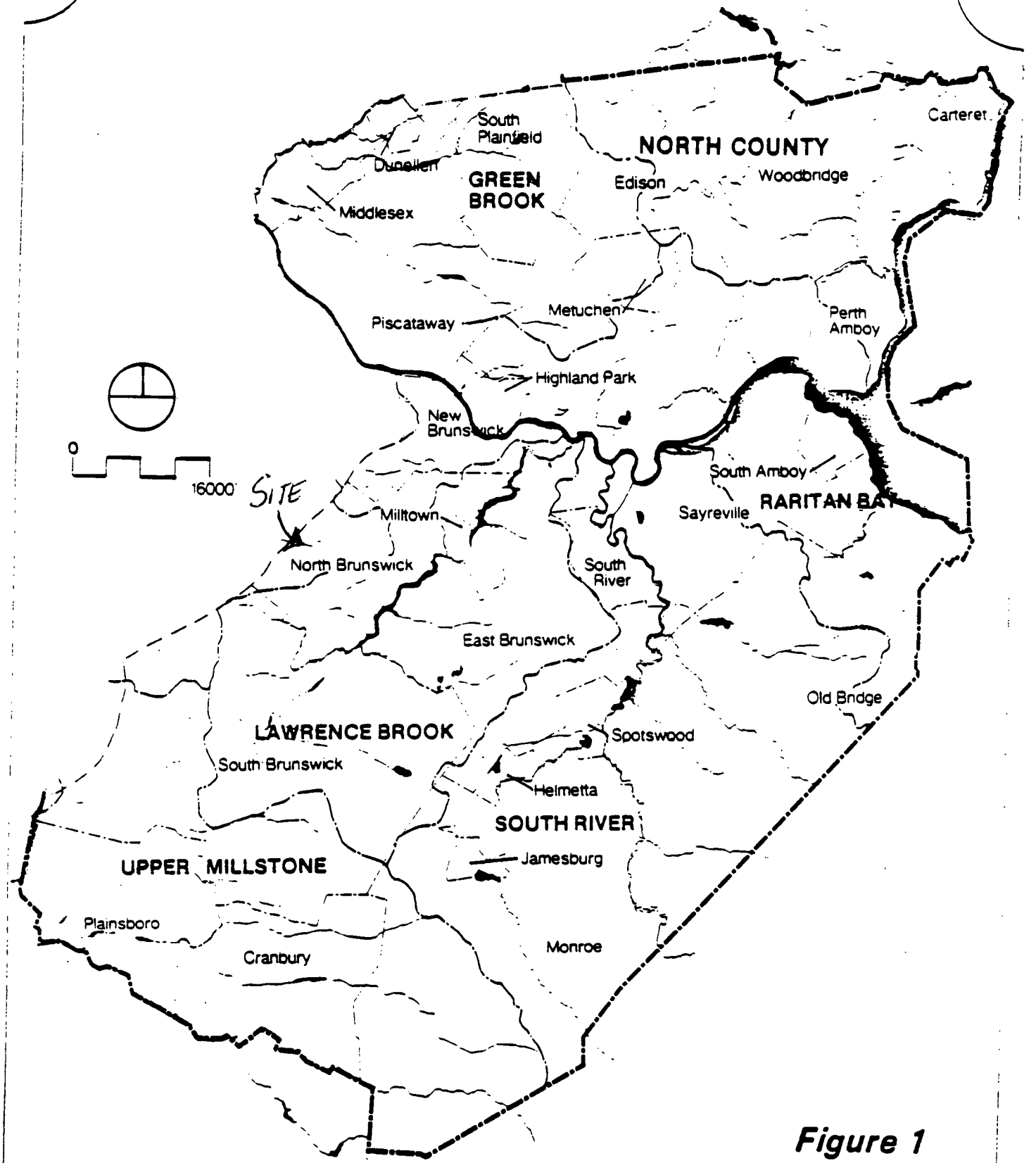


Figure 1

MAJOR DRAINAGE BASINS & STUDY AREA MUNICIPALITIES

TABLE 3

Hydrostratigraphic Sequence in Middlesex County [5]

Cenozoic Sequence
- Quarternary System
  - Recent Series
    - Alluvium
    - Eolin deposits
  - Pleistocene series
    - Wisconsin drift
    - Cape May formation
    - Pensauken formation

Unconformity

Mesozoic Sequence
- Cretaceous System
  - Upper Cretaceous series
    - Mount Laurel and Wenonah Sands
    - Marshalltown formation
    - Englishtown sand
    - Woodbury clay
    - Merchantville clay
    - Magothy formation
    - Raritan formation
      - Amboy stoneware clay
      - Old Bridge sand
      - South Amboy fire-clay
      - Sayreville sand
      - Woodbridge clay
      - Farrington sand
      - Raritan fire-clay

Unconformity

Triassic System
- Upper Triassic series (Newark group)
  - Brunswick shale
  - Lockatong formation
  - Stockton formation

Unconformity

Proterozoic Sequence
- Pre-Cambrian
  - Wissahickon formation

this study an attempt has been made to evaluate and summarize the geologic characteristics of the rocks as they relate to their water carrying and water producing capacity.

C. Quarternary System

1. Wisconsin Drift

The Wisconsin Drift was deposited by the last four continental ice sheets of the Pliestoncene Age which covered large portions of the northern United States. It forms a nearly continuous mantle over the underlying Triassic and Cretaceous rocks in the northeastern part of Middlesex County. The southern limit reached by the Wisconsin glacier in Middlesex County is roughly along a line from Plainfield to Metuchen and over to the mouth of the Raritan River at Perth Amboy.[8] The Wisconsin Drift is of importance from a water supply standpoint primarily because some portions are permeable enough to absorb water directly from precipitation and transmit it readily into underlying beds.

The outwash plain found between Metuchen, Plainfield and east Bound Brook covers an estimated 16 square miles and consists of layers of sand and gravel which together are called stratified drift. The stratified drift is approximately 10 to 60 feet thick on the eastern edge near the moraine. In general the stratified drift is quite permeable but it is too shallow and covers too small an area to be in itself an important water supply source. However, it holds water which percolates into the underlying Brunswick formation and has increased the yield of many wells located on the drift.[9]

2. Cape May Formation

The Cape May formation is a pinkish-yellow fine to medium grained quartz sand forming a thin mantle 3 to 10 feet thick over the Cretaceous formation in the South River valley as well as along the south shore of the Raritan River.

The average porosity of the Cape May formation is 43% and the average specific yield is 38%. The coefficient of permeability ranges between 180 to 900 with a weighted average of 450. A block of Cape May Sand one square mile in area and one foot thick is capable of storing approximately 80 million gallons of water.[10]

The important hydrologic feature of the Cape May formation is that it overlies the Old Bridge Sand aquifer and increases its recharge capacity. No major water supplies are drawn directly from the Cape May formation at the present time.

3. Pensauken Formation

In the southern portion of Middlesex County most of the hills and upland areas (above 60 feet elevation) are covered with a layer of yellow to brown, clayey sand and gravel known as the Pensauken formation. The largest

area is between the Lawrence Brook and South River extending southwest to Cranbury. The Pensauken formation in this area is of importance in that it covers the truncated sand members of the Raritan formation.

The Pensauken formation ranges in thickness to 70 feet with the average porosity and specific yield estimated to be 40% and 30% respectively. The coefficient of permeability is considerably less than the Cape May formation, ranging between 120 and 200 and averages approximately 170. A block of the Pensauken formation 1 square mile in area and 1 foot thick could store an estimated 64 million gallons of available water.

No large water supplies have been developed from the Pensauken formation however it does yield small supplies of water to a large number of wells for domestic and farm use. Its importance from an hydrologic standpoint is in that it readily absorbs water from precipitation and transmits it to underlying aquifers resulting in an increase in the effective recharge area. Much of the intake area of the Farrington Sand and a portion of the intake area of the Old Bridge Sand is overlain by the Pensauken formation.

D. Cretaceous System

1. Englishtown Sand

The Englishtown Sand occurs near the southeastern border of the County and is a fine to medium-grained white or yellow sand which is occasionally micaceous, lignitic and limonitic. The Englishtown Sand in Middlesex County is approximately 100 feet thick and is overlain by the relatively impermeable Marshalltown formation.

Physical properties of the formation vary widely. The weighted average coefficient of permeability is 525 with the average porosity 44% and specific yield 30%. On the basis of the physical properties and the performance of wells tapping this resource in Monmouth County, the Englishtown Sand is in all probability the third most productive Coastal Plain in Middlesex County. At the present time however, no large water supplies have been developed from this formation in Middlesex County because of its relatively remote location from population and industrial centers. It should be noted that the Englishtown Sand is the second major source of water supply to Monmouth County. A number of wells in this formation yield more than 0.5 mgd. It is possible to develop a water supply of approximately 5.0 million gallons per day from this source in the County.11

2. Magothy-Raritan Formations

Although the Magothy and Raritan formation are distinct geologic units, they are frequently in direct hydraulic contact and are considered part of the same aquifer system. Northeast of Jamesburg, the Raritan formation has been divided into seven members, three of which are water bearing. Even though it is possible to divide the Raritan formation into seven distinct

members, attempts to trace recognized units in the outcrop areas, both along the strike and downdip, have been only moderately successful.[12] Hydrogeologic characteristics of units in Raritan formation have been summarized in Table 4.

3. Magothy Formation

The Magothy formation lies immediately above the Raritan formation and is separated from the Old Bridge Sand member by the Amboy Stoneware Clay. Average porosity of the Magothy formation is 46% and specific yield is approximately 41%. The coefficient of permeability ranges between 60 and 925 with a weighted average of 296. A block of Magothy formation one square mile in area and one foot thick can store 85 million gallons of water.

While the Magothy formation is capable of storing large quantities of water it does not transmit it freely due to its low coefficient of permeability. At the present time no significant supply of water is drawn from this formation although numerous wells for domestic and agricultural uses draw water from this source. Due to its low permeability and transmissivity, successful development of large capacity wells in the Magothy formation would be difficult if not impossible to accomplish.

4. Old Bridge Sand

The Old Bridge Sand member of the Raritan formation is the most productive and intensely developed aquifer in Middlesex County. It outcrops or is exposed beneath permeable Pliestocene deposits in an irregular band that extends from Raritan Bay near South Amboy to and probably beyond Jamesburg. It has an intake area of approximately 25 square miles, a thickness of 80 to 110 feet and dips gently to the southeast at 40 to 45 feet per mile.

The Old Bridge Sand is well sorted and is composed of fairly fine to coarse sand or fine gravel. The average porosity of the Old Bridge Sand is estimated to be 42% and specific yield is 40%. The coefficient of permeability ranges between 1000 and 1500. The Old Bridge Sand is capable of storing and transmitting large quantities of water; for example, a block of Old Bridge Sand one square mile in area and one foot thick would store about 84 million gallons of available water. The sand can transmit approximately 1 mgd for each square mile of aquifer.[13]

5. Farrington Sand

The Farrington Sand outcrops in a contiguous band nearly a mile wide along the southeast edge of Farrington Lake in East Brunswick. It has a total outcrop area of approximately 22.3 square miles, of which 10.9 square miles lie south of the Raritan River and 11.4 square mile lie north. The effective recharge area of the Farrington Sand is 16.9 square miles and has an average thickness of 80 feet, dipping gently to the southeast at the rate of 45 to 55 feet per mile.

The Farrington Sand is a medium to coarse grained sand with an average porosity estimated at 34% and specific yield 32%. The coefficient of permeability ranges between 210 and 3500 with a weighted average between 1,200 and 1,500. The Farrington Sand is also capable of storing and transmitting large quantities of water. A block of the Farrington Sand one square mile in area and 1 foot in thickness would be capable of storing almost 67 million gallons of available water. It can transmit more than 2.5 mgd for each square mile of aquifer.14

E. Triassic System

1. Newark Group

The rocks of the Newark Group are the third most important aquifer in the County (behind the Old Bridge Sand and Farrington Sand) because of their areal extent and large amount of water developed from them. The oldest is the Stockton formation consisting of conglomerate and sandstone interbedded with red shale. Next oldest is the Locatong formation consisting of hard shale and argullite. The two rocks are found in a small area near the southwestern border of the County. The Brunswick formation is a red shale interbedded with siltstone and occassional layers of sandstone and covers the entire area north of a line between Carteret and Plainsboro.

These formations are rather impermeable except along numerous cracks which traverse the beds at high angles to the bedding. Some water may flow along the bedding planes but such movements are limited. These rocks dip to the northwest at angles ranging from 5o to 15o

The fact that these rocks are usually fine grained, relatively impermeable and are water bearing by virtue of their cracks and crevices, introduces problems in any attempt to appraise their water bearing capacity. The permeability and specific yield of the Newark Group depends upon the degree of cracking. Since the degree of cracking decreases with the depth, the permeability and specific yield also decreases with the depth. The cracks in the rocks of the Newark Group intersect one another at many angles; the result being that water can move almost in any direction. Figure 3 shows the area of the Brunswick formation covered with permeable material to a thickness of 40 to 45 feet.

The coefficient of transmissibility of the Brunswick Shale is approximately 25,000 (as compared to 96,000 for the Farrington Sand and 108,000 for the Old Bridge Sand) and the storage coefficient is approximately 0.0044.15 This means that Farrington and Old Bridge Sands can transmit four times as much water as the rocks of Newark Group under a given hydraulic head and through a given width of section. The difference in the capacity of the Newark Group to store water is even more striking. For one square mile area and 300 feet of saturated thickness Newark Group rocks would hold only 275 million gallons of water. By comparison 80 feet of the Farrington Sand would hold 5,360 million gallons of water for the same area. The low storage capacity explains the high rate of run-off and low ground water flows observed in streams draining areas underlain by Newark Group formations where there is no permeable cover material.

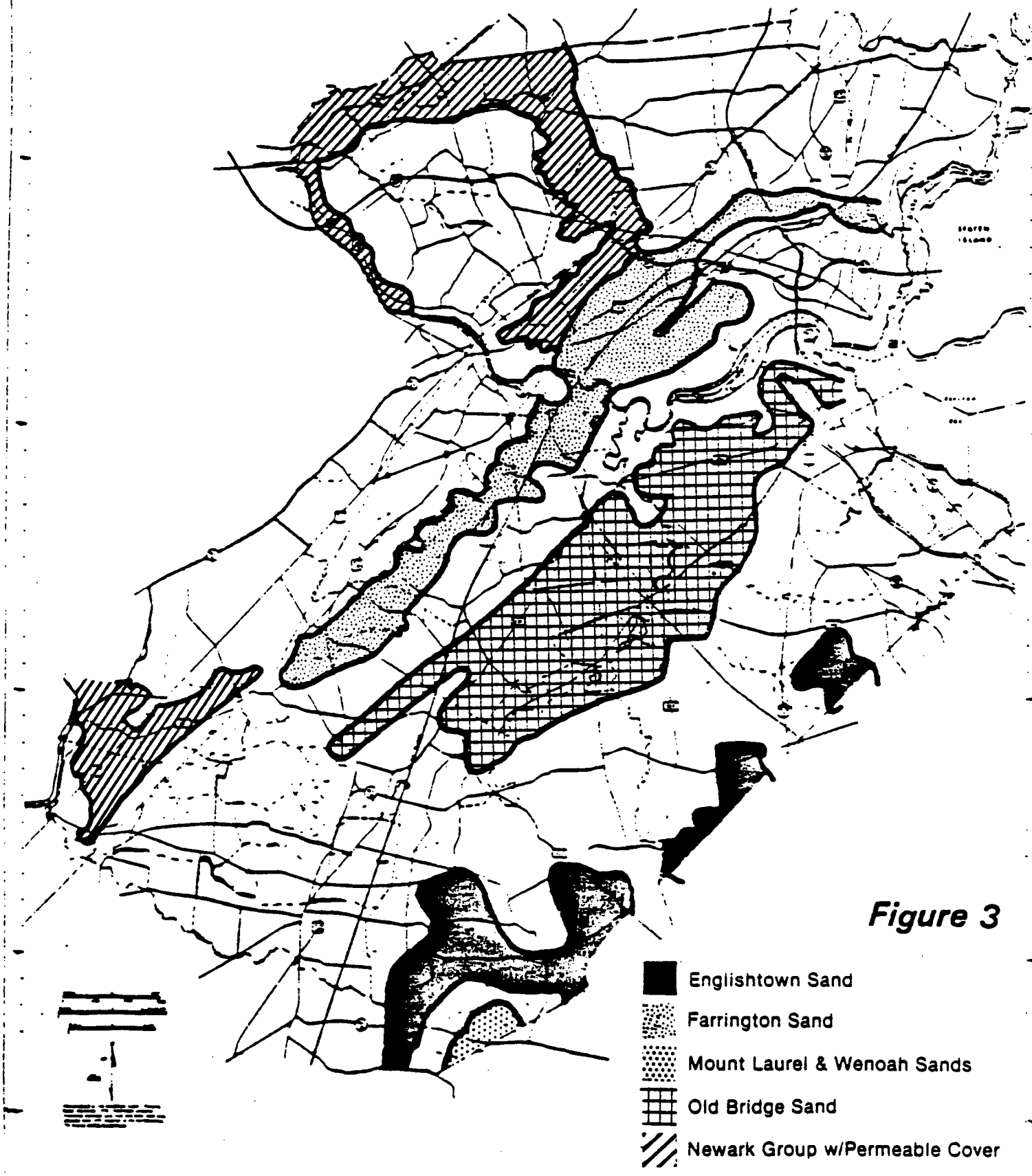


Figure 3

AQUIFER RECHARGE AREAS

REFERENCE NO. 17

Date: _____
Company
By: _____
Date: _____
Contractor
By: _____
Date: _____

[FR Doc. 84-1452 Filed 1-23-84; 8:45 am]
BILLING CODE 6560-50-M

[OW-FRL-2460-3]

Brunswick Shale and Sandstone Aquifer of the Ridgewood Area, New Jersey; Final Determination

AGENCY: U.S. Environmental Protection Agency.

ACTION: Notice.

SUMMARY: Pursuant to Section 1424(e) of the Safe Drinking Water Act, the Administrator of the U.S. Environmental Protection Agency (EPA), has determined that the Brunswick Shale and Sandstone Aquifer, underlying the Ridgewood Area, is the sole or principal source of drinking water for Ridgewood, Midland Park, Glen Rock, and Wyckoff, New Jersey, and that the aquifer, if contaminated, would create a significant hazard to public health. As a result of this action, Federal financially assisted projects constructed in the Ridgewood Area and its streamflow source zone (upstream portions of Ho Ho Kus Brook and Saddle River Run drainage basins) will be subject to EPA review to ensure that these projects are designed and constructed so that they do not create a significant hazard to public health.

ADDRESSES: The data on which these findings are based are available to the public and may be inspected during normal business hours at the U.S. Environmental Protection Agency, Water Supply Branch, 26 Federal Plaza, New York, New York 10278.

FOR FURTHER INFORMATION CONTACT: Damina J. Duda, Water Supply Branch, 26 Federal Plaza, New York, New York 10278 (212) 264-1800.

SUPPLEMENTARY INFORMATION: Notice is hereby given that pursuant to Section 1424(e) of the Safe Drinking Water Act (42 U.S.C., 300f, 300h-3(e), Pub. L. 93-523), the Administrator of the U.S. Environmental Protection Agency (EPA) has determined that the Brunswick Shale and Sandstone aquifer of the Ridgewood Area is the sole or principal source of drinking water for Ridgewood, Midland Park, Glen Rock, and Wyckoff, New Jersey. Pursuant to Section 1424(e), Federal financially assisted projects constructed in the Ridgewood Area and its streamflow source zone (upstream portions of Ho Ho Kus Brook, and

Saddle River Run drainage basins) will be subject to EPA review.

I. Background

Section 1424(e) of the Safe Drinking Water Act state:

(e) If the Administrator determines on his own initiative or upon petition, that an area has an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health, he shall publish notice of that determination in the Federal Register. After the publication of any such notice, no commitment for Federal financial assistance (through a grant, contract, loan guarantee, or otherwise) may be entered into for any project which the Administrator determines may contaminate such aquifer through a recharge zone so as to create a significant hazard to public health, but a commitment for Federal financial assistance may, if authorized under another provision of law, be entered into to plan or design the project to assure that it will not so contaminate the aquifer.

On July 4, 1979, the Committee to keep Our Water Pure petitioned EPA to designate the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area as sole source aquifer. On January 15, 1980, EPA published a notice in the Federal Register announcing a public comment period and setting a public hearing date. A public hearing was conducted on February 28, 1980, and the public was allowed to submit comments on the petition until March 28, 1980.

II. Basis for Determination

Among the factors to be considered by the Administrator in connection with the designation of an under Section 1424(e) are: (1) Whether the aquifer is the area's sole or principal source of drinking water, and (2) whether contamination of the aquifer would create a significant hazard to public health.

On the basis of information available to this Agency, the Administrator has made the following findings, which are the basis for the determination noted above:

1. The Brunswick Shale and Sandstone Aquifer of the Ridgewood Area is the "sole source" of drinking water for the approximately 68,820 residents of Ridgewood, Midland Park, Glen Rock, and Wyckoff, New Jersey.

2. There is no existing alternative drinking water source or combination of sources which provides fifty percent or more of the drinking water to the designated area.

3. The Brunswick formation is a soft red shale interbedded with coarse grained sandstone. The aquifer is overlain by permeable unconsolidated glacial and recent deposits. As a result of permeable soil characteristics, the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area is highly susceptible to contamination through its recharge zone from a number of sources, including but not limited to, chemical spills, leachate from landfills, stormwater runoff, highway deicers, faulty septic systems, wastewater treatment systems, and waste disposal lagoons. The aquifer is also susceptible to contamination to a lesser degree from the same sources, through its streamflow source zone. Since ground water contamination can be difficult or impossible to reverse and since the aquifer in this area is solely relied upon for drinking water purposes by the population of the Ridgewood Area, contamination of the aquifer could pose a significant hazard to public health.

III. Description of the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area, Its Recharge Zone and Its Streamflow Source Zone

The Brunswick Shale and Sandstone Aquifer is a soft red shale interbedded with coarse grained sandstone. The formation, located in northern New Jersey, is fairly large, extending south into Pennsylvania and north into New York. Igneous intrusions which form the Watchung Mountains and the Palisades, also form the western and eastern boundaries of the Burnswick formation, respectively. The area in which Federal financially assisted projects will be subject to review is the portion of the Brunswick Shale and Sandstone Aquifer in the Ridgewood Area, its streamflow source zone, and its recharge zone.

For the purposes of this designation, the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area is considered to include the entire municipalities of Ridgewood, Midland Park, Glen Rock, and Wyckoff, New Jersey. It's recharge zone is considered to be one and the same with this area. The streamflow source zone is that portion of the drainage basins of Ho Ho Kus Brook and Saddle River Run located upstream of the Ridgewood area. This includes all or a portion of the following New Jersey municipalities: Waldwick, Allendale, Ramsey, Mahwah, Franklin Lakes, Ho Ho Kus, Saddle River, Upper Saddle River, Woodcliff Lake, Hillside, Washington, Montvale, as well as Ramapo Township, New York.

IV. Information Utilized in Determination

The information utilize in this determination includes the petition, written and verbal comments submitted by the public, and various technical publications. The above data is available to the public and may be inspected during normal business hours at the U.S. Environmental Protection Agency, Region II, Water Supply Branch, 26 Federal Plaza, New York, New York 10278.

V. Project Review

EPA Region II is working with the Federal agencies that may in the future provide financial assistance to projects in the area of concern. Interagency procedures have been developed through which EPA will be notified of proposed commitments by Federal agencies for projects which could contaminate the Brunswick Shale and Sandstone Aquifer, upon which the Ridgewood Area is dependent for its sole source water supply. EPA will evaluate such projects and, where necessary, conduct an in-depth review, including soliciting public comments where appropriate. Should the Administrator determine that a project may contaminate the aquifer through its recharge zone so as to create a significant hazard to public health, no commitment for Federal financial assistance may be entered into. However, a commitment for Federal financial assistance may, if authorized under another provision of law, be entered into to plan or design the project to assure that it will not so contaminate the aquifer.

Although the project review process cannot be delegated, the U.S. Environmental Protection Agency will rely to the maximum extent possible on any existing or future State and local control mechanisms in protecting the ground water quality of the Brunswick Shale and Sandstone Aquifer on which the Ridgewood Area is dependent for its sole source water supply. Included in the review of any Federal financially assisted project will be coordination with the State and local agencies. Their comments will be given full consideration and the Federal review process will attempt to complement and support State and local ground water protection mechanisms.

VI. Summary and Discussion of Public Comments

Most comments were generally in favor of designation. Two local governments submitted resolutions in support of designation. Only two commenters expressed any reservations regarding the designation.

One commenter expressed concern that the proposed designation would provide protection which is duplicative of State and local controls and may lead to unnecessary bureaucratic delays of

projects. Although a number of ground water protection measures are available at the Federal, State and local level, none of these, either, individually or collectively, permit EPA to act as directly as would a sole source designation in the review and approval of Federal financially assisted projects. In addition, EPA feels that the sole source project review process will foster integration rather than duplication of environmental review efforts. Memoranda of Understanding have been negotiated with various Federal agencies, with the purpose of streamlining the review process and minimizing project delays.

One commenter expressed concern that the area proposed for sole source designation could be an arbitrary political subdivision of the larger Brunswick aquifer system. The commenter questioned whether sufficient consideration had been given to the physical limits of the hydrologic system. The EPA recognizes that the aquifer does indeed cover a large area. However, a significant portion of the population in these other areas utilize other sources of water supply or have alternative sources available.

Concern was also raised that the Ridgewood Area may have alternative water supply available through adjacent water purveyors; specifically, the Passaic Valley Water Commission or the Hackensack Water Company. EPA has reviewed this matter and determined that either insufficient supply is currently available (in one case) or interconnections between the Ridgewood Area and the purveyor are currently not adequate to handle the Area's demand. Furthermore, the Brunswick Shale and Sandstone Aquifer in the Ridgewood Area is a source of water for export to adjacent purveyors during drought conditions.

The area considered for designation was determined to meet the criteria of an area which depends upon an aquifer for its sole or principal drinking water source and which, if contaminated, would pose a serious threat to the health of the Ridgewood Area residents.

VII. Economic and Regulatory Impact

Pursuant to the provisions of the Regulatory Flexibility Act (RFA), 5 U.S.C. 605(b), I hereby certify that the attached rule will not have a significant impact on a substantial number of small entities. For purposes of this Certification the "small entity" shall have the same meaning as given in Section 601 of the RFA. This action is only applicable to the Ridgewood Area. The only affected entities will be those Area-based businesses, organizations or governmental jurisdictions that request Federal financial assistance for projects which have the potential for contaminating the aquifer so as to create a significant hazard to public health. EPA does not expect to be reviewing small isolated commitments of financial assistance on an individual basis, unless a cumulative impact on the aquifer is anticipated; accordingly, the number of affected small entities will be minimal.

For those small entities which are subject to review, the impact to today's action will not be significant. Most projects subject to this review will be proceded by a ground water impact assessment required pursuant to other Federal laws, such as the National Environmantal Policy Act, as amended (NEPA), 42 U.S.C. 4321, et seq. Integration of those related review procedures with sole source aquifer review will allow EPA and other Federal agencies to avoid delay or duplication of effort in approving financial assistance, this minimizing any adverse effect on those small entities which are affected. Finally, today's action does not prevent grants of Federal financial assistance which may be available to any affected small entity in order to pay for the redesign of the project to assure protection of the aquifer.

Under Executive Order 12291, EPA must judge whether a regulation is "major" and therefore subject to the requirement of a Regulatory Impact Analysis. This regulation is not major because it will not have an annual effect of $100 million or more on the economy, will not cause any major increase in costs or prices, and will not have significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of United States enterprises to compete in domestic or export markets. Today's action only affects the Brunswick Shale and Sandstone Aquifer of the Ridgewood Area. It provides an additional review of ground-water protection measures, incorporating State and local measures whenever possible, for only those projects which request Federal financial assistance.

Dated: January 12,1983.

William D. Ruckelshaus,
Administrator.

[FR Doc. 84-1887 Filed 1-23-84; 8:45 am]
BILLING CODE 6560-50-M

REFERENCE NO. 18

Uncontrolled Hazardous Waste Site Ranking System

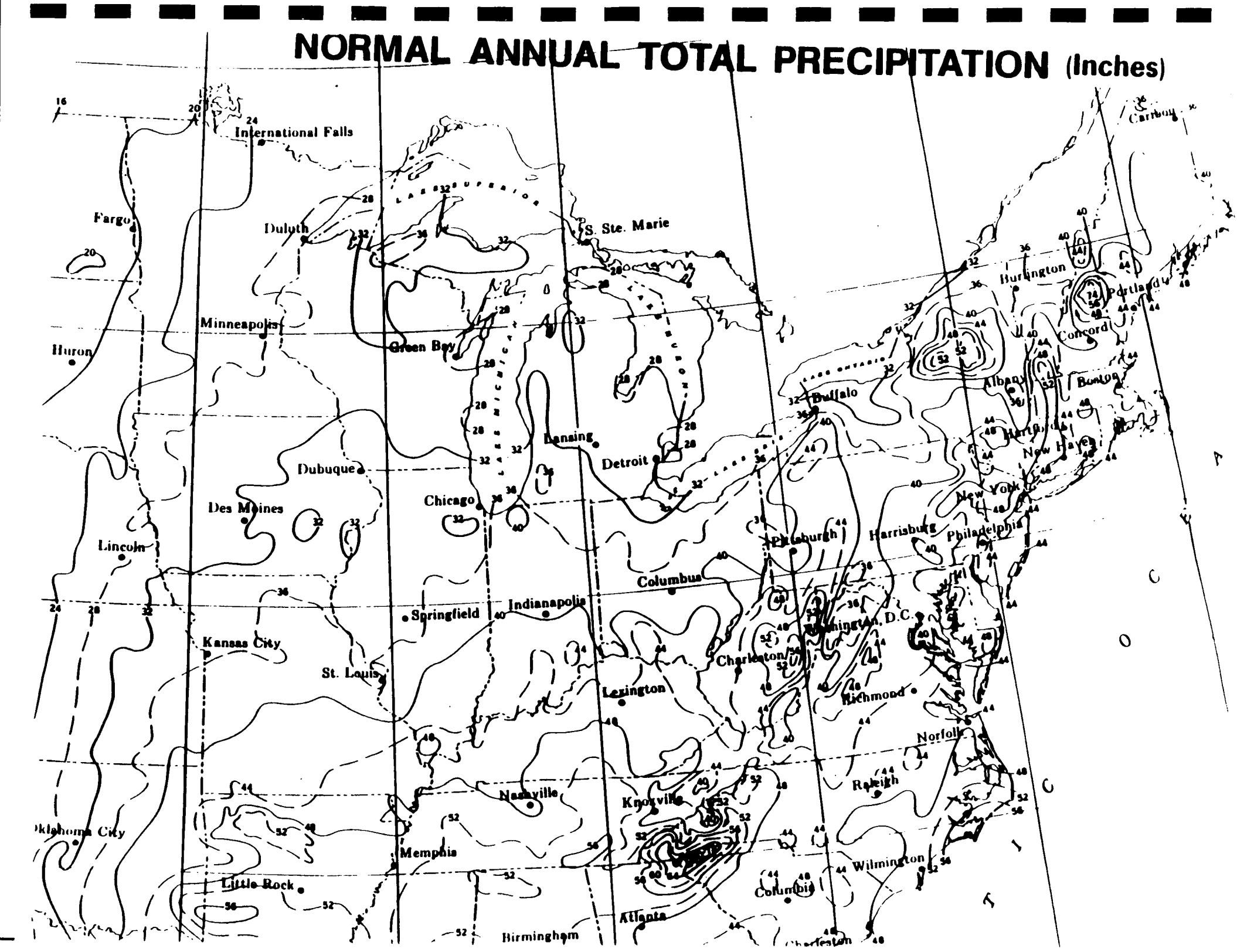
A Users Manual
(HW-10)

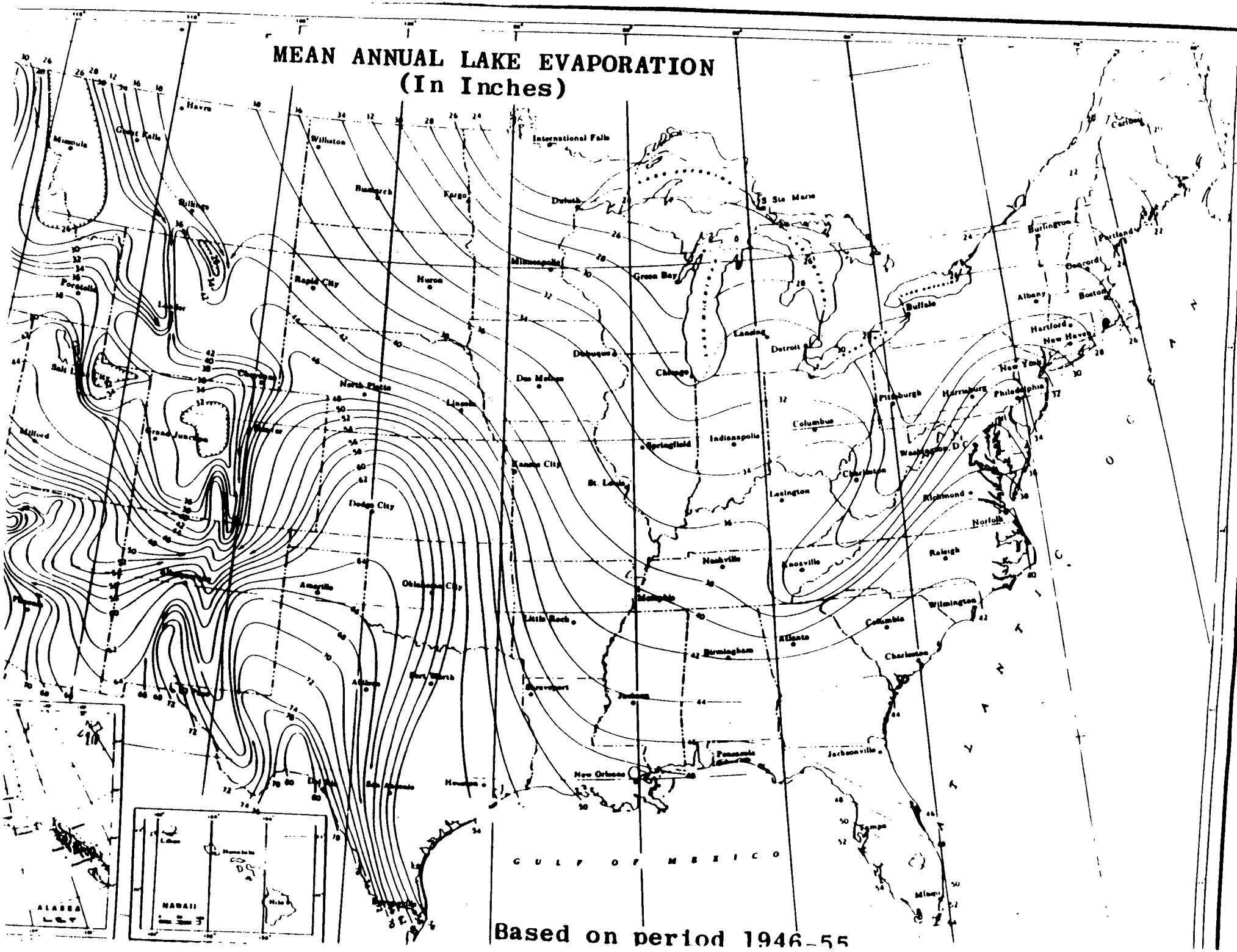
Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984

NORMAL ANNUAL TOTAL PRECIPITATION (Inches)




MEAN ANNUAL LAKE EVAPORATION
(In Inches)
Based on period 1946-55
GULF OF MEXICO
ALASKA
HAWAII

1 YEAR 24-HOUR RAINFALL (inches)

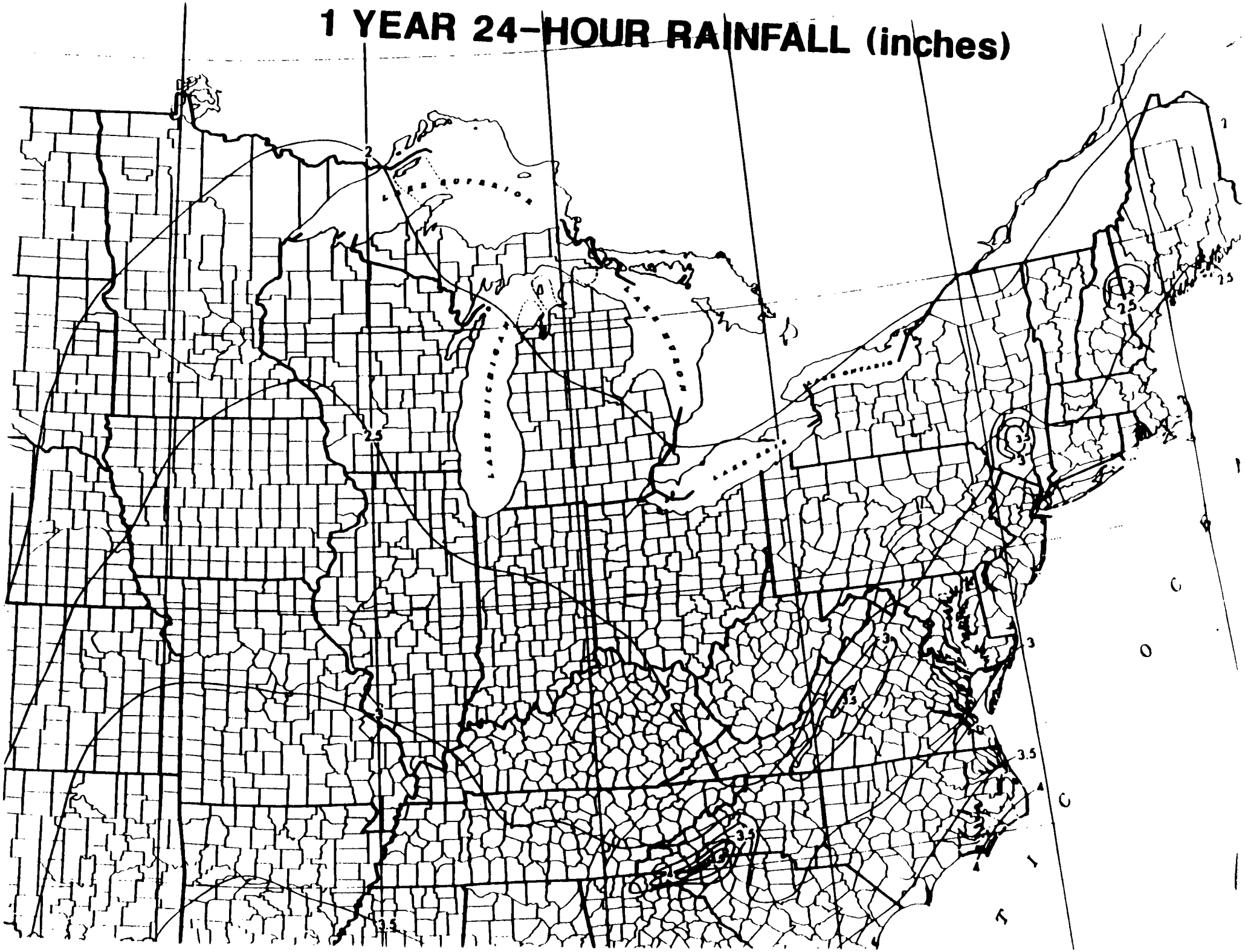


TABLE 2

PERMEABILITY OF GEOLOGIC MATERIALS*

Type of Material	Approximate Range of Hydraulic Conductivity	Assigned Value
Clay, compact till, shale; unfractured metamorphic and igneous rocks	$<10^{-7}$ cm/sec	0
Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till	$10^{-5} - 10^{-7}$ cm/sec	1
Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till	$10^{-3} - 10^{-5}$ cm/sec	2
Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and dolomite	$>10^{-3}$ cm/sec	3

*Derived from:

Davis, S. N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWest ed., Academic Press, New York, 1969

Freeze, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979

REFERENCE NO. 19

STATE OF NEW JERSEY

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DAVID J. BARDIN, COMMISSIONER

WATER SUPPLY OVERLAY
SHEET 28

LEGEND

AREA SERVED BY PRIVATE WATER SERVICE COMPANIES

AREA SERVED BY REGIONALLY OWNED WATER SERVICE COMPANIES

AREA SERVED BY MUNICIPALLY OWNED WATER SERVICE COMPANIES

AREA NOT PRESENTLY SERVED BY WATER SERVICE

PUBLIC SUPPLY WELLS

SURFACE WATER INTAKE

—W— MAJOR WATER MAINS

– – – – – TOWNSHIP BOUNDARIES

— — — COUNTY BOUNDARIES

— • • — STATE BOUNDARIES

ALL MAP COORDINATES ARE FOR THE LOWER LEFT HAND CORNER.

Scale: 1:63,360

1 ½ 0 1 2 3 Kilometers

1 ¾ ½ ¼ 0 1 2 3 Miles

SUPERVISED BY GEORGE J. HALASI-KUN, TOPOGRAPHIC ENGINEER
DRAFTED BY JOHN F. OLSCHEWSKI

ANY CORRECTIONS OR ADDITIONAL INFORMATION WILL BE APPRECIATED

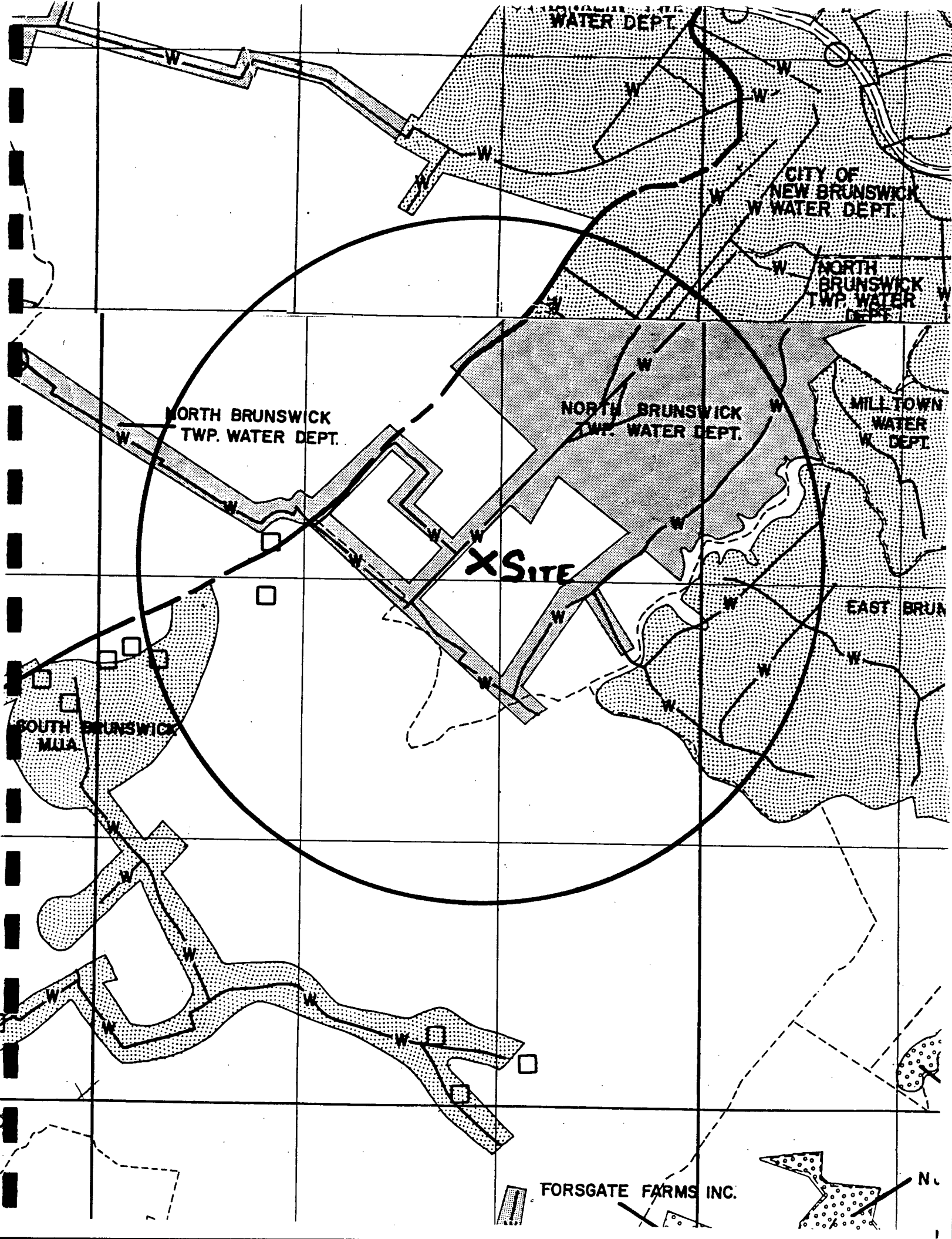
AUGUST 1975

WATER SUPPLY OVERLAY SHEET 28

	28-01-715	Hopewell Borough
	28-02-119	Elizabethtown Water Company
	28-02-135	Elizabethtown Water Company
	28-02-175	Elizabeth Water Company
	28-02-179	Elizabethtown Water Company
	28-02-498	Rocky Hill Realty Co.
	28-02-661	Brunswicktown Water Company
	28-02-665	Brunswicktown Water Company
	28-02-982	Manor Real Estate and Trust Co.
*	28-03-195	Franklin House Bldg. Corp.
	28-03-417	Brunswicktown Water Co.
	28-03-418	Brunswicktown Water Co.
*	28-03-419	Brunswicktown Water Co.
*	28-03-432	St. Augustine's School
	28-03-891	South Brunswick MUA
	28-03-898	South Brunswick MUA
	28-03-975	South Brunswick MUA
	28-04-559	East Brunswick Township
	28-04-987	Reliable Water Company
	28-04-988	Reliable Water Company
	28-05-166	Sayreville Borough
	28-05-169	Sayreville Borough
	28-05-193	Sayreville Borough
	28-05-195	Sayreville Borough
	28-05-199	Sayreville Borough
	28-05-412	South River Borough
	28-05-412	South River Borough
	28-05-431	Sayreville Borough
	28-05-431	Sayreville Borough
	28-05-436	Perth Amboy City
	28-05-438	Perth Amboy Water Company
	28-05-439	Perth Amboy City
	28-05-722	Madison Township Mun. Util. Auth.
	28-05-722	Madison Township Mun. Util. Auth.
	28-05-726	Madison Water Company
	28-05-726	Madison Water Company
	28-11-828	Princessville Res. Park
	28-11-943	State of New Jersey
	28-12-112	Princeton Water Company
	28-12-124	Princeton Water Company
	28-12-191	Princeton Water Company
	28-12-272	Holiday Inn
	28-12-272	Holiday Inn
	28-12-274	Princeton Water Company
	28-13-345	Forsgate Water Company
	28-13-385	Forsgate Farm
	28-13-555	Cranbury Twp. Water Dept.
	28-13-588	Cranbury Water Dept.
	28-13-628	New Jersey Turnpike Authority
	28-13-715	East Windsor Mun. Auth.
	28-13-818	Cranbury Manor, Inc.
	28-13-818	Cranbury Manor, Inc.
	28-13-854	East Windsor Acres
	28-14-147	Forsgate Farms
	28-14-147	Forsgate Farms
	28-14-166	Jamesburg Water Company
	28-14-371	State of New Jersey
	28-14-438	Forsgate Farms
	28-15-713	Englishtown Boro
	28-21-393	Hamilton Square Water Company
	28-21-837	Bordentown Water Dept.
	28-21-944	Bordentown Water Dept.
	28-22-188	Hamilton Square Water Company
	28-22-221	Elizabethtown Water Company
	28-22-221	Elizabethtown Water Company
	28-22-322	Elizabethtown Water Company
	28-22-335	East Windsor Mun. Util. Auth.
	28-22-411	Hamilton Square Water Company
	28-22-451	Hamilton Square Water Company
	28-22-871	New Jersey Turnpike Authority
	28-22-871	New Jersey Turnpike Authority
	28-22-872	New Jersey Turnpike Authority
	28-22-949	Allentown Boro
	28-23-324	East Windsor Mun. Util. Auth.
	28-23-327	East Windsor Mun. Util. Auth.
	28-23-663	Roosevelt Boro
	28-24-362	Manalapan Water Company
	28-24-576	Millstone Township Bd. of Ed.
	28-25-135	Golf Realty, Inc.
	28-31-264	Bordentown City
	28-31-876	Columbus Water Company
	28-32-122	Crosswicks Water Company
	28-34-786	General Services Administration
	28-35-482	Jackson Township Bd. of Ed.
	28-35-482	Jackson Township Bd. of Ed.
	28-42-282	State of N. J. Police
	28-42-355	U. S. Air Force
	28-45-186	Naval Air Station
	28-45-453	U. S. Government
	28-45-455	U. S. Government

SURFACE WATER INTAKES

28-02-325	North Brunswick Water Dept.
28-05-438	City of Perth Amboy Water Dept.
28-05-445	Sayreville Water Dept.
28-12-419	Elizabethtown Water Company, Southern Division
	Princeton Water Company


WATER DEPT.
CITY OF NEW BRUNSWICK W WATER DEPT.
NORTH BRUNSWICK TWP. WATER DEPT.
NORTH BRUNSWICK TWP. WATER DEPT.
NORTH BRUNSWICK TWP. WATER DEPT.
MILL TOWN WATER W DEPT.
SITE
EAST BRUN
SOUTH BRUNSWICK MUA
FORSGATE FARMS INC.

REFERENCE NO. 20

02-9912-02

NUS CORPORATION — **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
	April 14, 1989	12:00

DISTRIBUTION:

BETWEEN:	OF:	PHONE:
Ed O'Rourke	City of New Brunswick Water Department	(201) 745-5060

AND: Joseph Dvorak (NUS)

DISCUSSION:

I talked with Ed O'Rourke about water (public) use in New Brunswick. He said that their water system uses no wells whatsoever. They get surface water from two places. They have 10.5 million gallons per day of water rites from the NJ Water Supply Authority, and that water comes from a surface water intake on the Delaware and Raritan Canal. The surface water intake is located along Georges Street behind Buccleuch Park.

The other surface water intake they get water from is located on Farrington Lake and they have 10 million gallons per day water rites from that lake. The intake is located near the intersection of Bunsen and Edgebrook Road.

They serve approximately 50,000 people, including Rutgers University.

4/14/89

ACTION ITEMS:

NUS 067 REVISED 0881

REFERENCE NO. 21

02-5812-08

NUS CORPORATION — **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
	7-13-89	0930

DISTRIBUTION: ERDA - New Brunswick Lab. 02-5812-08

BETWEEN:	OF:	PHONE:
Secretary to the Water Dept. Director	East Brunswick Water Department	(201) 390-6826

AND:

(NUS)

DISCUSSION:

The director of East Brunswick Water Department is Micheal Opalestki. She said East Brunswick Water Department purchases all of its water from the Middlesex Water Co. and they get their water from Sprace Run and Round Valley Reservoir.

ACTION ITEMS:

NUS 067 REVISED 0581

REFERENCE NO. 22

NUS CORPORATION AND SUBSIDIARIES — TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8906-41	7/18/89.	9:10 AM.

DISTRIBUTION: L.A. Drayfus Company

BETWEEN:	OF:	PHONE:
	Middlesex Water Co.	(201) 634-1500

AND: Magda Trujillo

DISCUSSION

I obtained the following information:

a) The Middlesex Water Co. serves approximately to 250,000 people.

b) The estimated number of wells is 30 ±

c) The depth of the wells is estimated to be from 75-600 feet.

d) Almost all the ~~the~~ wells in the area are tapped into the Brunswick Shale Aquifer.

Magda Trujillo
7/18/89.

ACTION ITEMS:

NUS 067 REVISED 0685

REFERENCE NO. 23

NUS CORPORATION — **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
02-8906-38	7/14/89	1400

DISTRIBUTION:

PERMACEL

BETWEEN:	OF:	PHONE:
Mr. Dow Krebs	North Brunswick Township Water Department	201 (418) 2244

AND:

Joseph Soriano (NUS)

DISCUSSION:

Mr. Krebs was asked about drinking water in North Brunswick Mr. Krebs said: All drinking water is from the Delaware Canal, it is over 3 miles from the site, and serves a population of 25,000 people. There are no other surface water intakes within 3 miles of the site. J.S. 7/14/89

ACTION ITEMS:

REFERENCE NO. 24

NUS CORPORATION AND SUBSIDIARIES — **TELECON NOTE**

CONTROL NO: 02-8906-471 / $475 NJ X 8 PA	DATE: July 25, 1989	TIME: 10:50

DISTRIBUTION:

Permutit R and D Center / AKA: Wyeth-Ayerst Research

BETWEEN:	OF:	PHONE:
Gerald Schwear / Superintendent	South Brunswick Municiple Utilities - Water Supply	(201) 329-4000

AND: Valerie Mathers — NUS

DISCUSSION:

I contacted the South Brunswick Municiple Utilities to inquire about their public water supply and was referred to Mr. Gerald Schwear. Mr. Schwear informed me that South Brunswick obtains approximately 2/3's of its potable water supply from wells in the Farrington Sands of the Potomac-Raritan-Magothy Aquifer System. The remainder of their supply is from surface water via the Elizabethtown Water Co. Mr. Schwear was unsure, however, as to which surface water Elizabeth town used.

South Brunswick has 5 water supply wells of which only 2 are actively used. One of the active wells, No. 11, is located in Dayton, NJ. and the other, No. 15, is located South of Dayton off of Route 130 on Broadway Road. The wells are not interconnected. South Brunswick's water utility serves many of the towns within South Brunswick Township including Monmouth Junction where Permutit R & D Center is located.

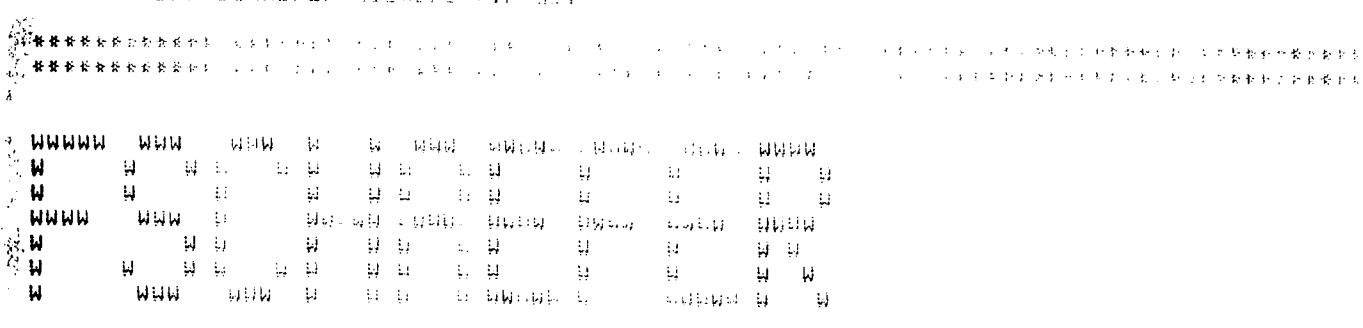
ACTION ITEMS:

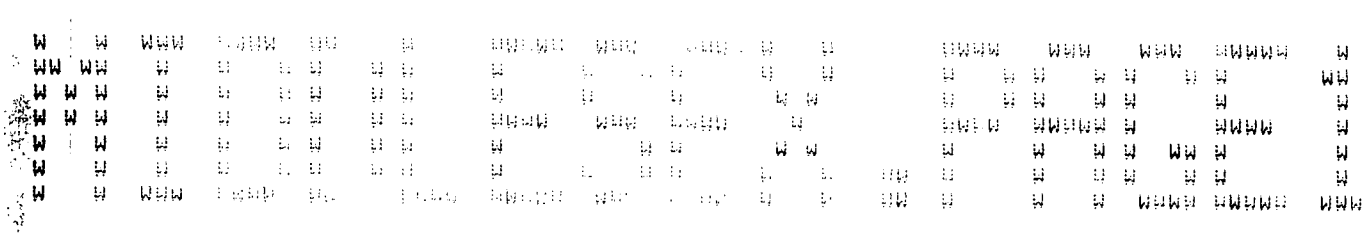
South Brunswick has emergency connections with other townships which are bilateral (ie - North Brunswick, Monroe, Elizabethtown Water Co.) and one where South Brunswick provides water supply, but does not receive supply (Franklin).

REFERENCE NO. 25

User: FSCHAEFER

<USER3>ADP>FSCHAEFER>MIDDLESEX.PAGE1





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U.S. GEOLOGICAL SURVEY TRENTON, NEW JERSEY

SELECTED INFORMATION OF WELLS FROM THE GROUND WATER SITE INVENTORY DATABASE
MIDDLESEX COUNTY

USGS UNIQUE ID	SITE ID	LATITU	LONGTU	MUNICIPALITY	SITE OWNER	LOCAL IDENTIFIER	DATE COMPLETED	USE OF SITE	ORIG WATER USE	CURR WATER USE	LAT LON ACC
30521	402023074374001	402023	743740	PLAINSBORO TWP	COLUMBIAN CARBN	WELL 1	/ /	W	N	N	S
30522	402348074230201	402413	742241	SPOTSWOOD BORO	SCHWEITZER, P J	11	10/14/1978	W	N	N	S
30523	403217074164101	403217	741641	PERTH AMBOY CITY	STANLEY CORP	2	06/16/1977	W	N	N	S
30524	403212074121901	403212	741619	PERTH AMBOY CITY	BIRD & SONS	2	10/08/1979	W	N	N	T
30525	402050074360801	402050	743608	PLAINSBORO TWP	FORRESTAL LABS	7	/ /	W			T
30526	402207074351301	402207	743513	S BRUNSWICK TWP	DOW JONES CO	1	01/01/1962	W	C	C	S
30527	402302074334201	402302	743342	S BRUNSWICK TWP	COLUMBIAN CARBN	10-1962	02/10/1951	W	N	N	S
30528	402447074302001	402447	743020	S BRUNSWICK TWP	GULF OIL CO	ABAN	/ /	U	U	U	S
30529	402451074272801	402448	742730	E BRUNSWICK TWP	KOBE JAPANESE REST	GAS LITE RES	/ /	W	I	U	S
30530	402518074330901	402519	743309	S BRUNSWICK TWP	BRUNSWICKTWN WC	BWC 8	12/02/1959	W	P	P	S
30531	402522074313001	402552	743130	S BRUNSWICK TWP	BRUNSWK RUBBER	2-1961	/ /	W	N	N	S
30532	402526074341401	402526	743414	S BRUNSWICK TWP	BRUNSWICKTWN WC	BWC 9	02/08/1960	W	P	P	S
30533	402528074313801	402528	743138	S BRUNSWICK TWP	FLAGPOST INN	1	/ /	W	H	H	S
30534	402536074201802	402536	742018	OLD BRIDGE TWP	PERTH AMBOY W D	OLD DEEP 8	/ /	W	P	P	S
30535*	402547074330501	402547	743305	S BRUNSWICK TWP	BRUNSWICKTWN WC	BWC 7	08/20/1959	W	P	P	S
30536	402620074301501	402620	743015	N BRUNSWICK TWP	JOHNSON&JOHNSON	WATER TANK	/ /	W	N	N	S
30537	402645074262001	402645	742620	MILLTOWN BORO	BARATTA BUILDER	HOUSE WELL	/ /	W	H	H	S
30538	402734074192501	402734	741925	SAYREVILLE BORO	E I DUPONT	2-OBS	/ /	W	U	U	S
30539	402820074264701	402820	742647	NEW BRUNSWICK CITY	RODIE RUBBER CO	1	/ /	O	U	U	S
30540	403000074264401	403000	742644	N BRUNSWICK TWP	JOHNSON&JOHNSON	1	/ /	W	N	N	S
30541	403231074151801	403231	741518	WOODBRIDGE TWP	SHELL OIL CO	44	/ /	W	N	N	S
30542	403232074152201	403232	741522	WOODBRIDGE TWP	SHELL OIL CO	2(28)	/ /	W	N	N	S
30543	403242074152301	403242	741526	WOODBRIDGE TWP	SHELL OIL CO	5(S2)	/ /	W	N	N	S
30544	403243074153801	403242	741531	WOODBRIDGE TWP	SHELL OIL CO	4(S1)	/ /	O	N	U	S
30545	403243074155301	403243	741533	WOODBRIDGE TWP	SHELL OIL CO	5	/ /	Z	N	U	S
30546	403249074153401	403249	741538	WOODBRIDGE TWP	SHELL OIL CO	9	/ /	W	N	N	S
30547	403250074151301	403250	741534	WOODBRIDGE TWP	SHELL OIL CO	3	/ /	W	N	N	S
30548	403257074151701	403257	741539	WOODBRIDGE TWP	SHELL OIL CO	8(R7)	/ /	O	N	U	S
30549	402746074314203	402745	741445	SAYREVILLE BORO	SAYREVILLE W D	SWD R	05/01/1980	O	N	U	S
30550	403537074201901	403537	742720	DUNELLEN BORO	A C PRINTING CO	5	08/31/1950	W	P	P	F
30551	402557074215901	402548	742155	SOUTH RIVER BORO	SOUTH RIVER W D	SRWD 6	03/01/1980	W	C	C	S
30552	402018074302102	402018	743021	S BRUNSWICK TWP	S BRUNSWICK MUA	15	05/01/1979	W	P	P	S
30553	401950074275001	401950	742750	MONROE TWP	MONROE TWP MUA	TEST 16	07/17/1980	W	P	P	S
30554	402738074164901	402745	741645	SAYREVILLE BORO	SAYREVILLE W D	SWD 5	04/21/1980	Z	U	U	S
30555	401958074281701	402010	742811	MONROE TWP	MONROE TWP MUA	TEST 17	07/25/1980	W	P	P	S
30556	401950074272101	401950	742721	MONROE TWP	MONROE TWP MUA	TW-16A	10/09/1980	W	U	P	S
30557	392833074163701	402833	741637	SAYREVILLE BORO	SOUTH AMBOY W D	SAWD 9A	09/21/1979	Z	U	U	S
30558	403220074182001	403220	741820	WOODBRIDGE TWP	FUTZ, STEPHEN	1	11/27/1954	W	P	P	F
30559	403420074163301	403420	741633	WOODBRIDGE TWP	SECURITY STEEL	1	02/01/1957	W	I	I	T
30560	403553074152701	403553	741527	WOODBRIDGE TWP	NATIONAL VARNIS	1	01/01/1949	W	N	N	T
30561	403313074160701	403313	741607	EDISON TWP	HOME FOR DIAB V	1	02/01/1957				T
30562	403500074203301	403500	742033	EDISON TWP	NEW DOVER CHURC	1	08/03/1955				T
30563	402527074200701	402527	742007	OLD BRIDGE TWP	PERTH AMBOY W D	1	01/01/1923	W	P/	U	T

* nearest public supply well (not currently used, see Ref. 24)

SELECTED INFORMATION OF WELLS IN THE GROUND WATER SITE INVENTORY DATABASE
MIDDLESEX COUNTY

SGS NIQUE D	ALTITUD	METH ALT MEAS	ALTI-TUDE ACC	WATER LEVEL	DATE LEVEL MEASURED	PRODU-TION LEVEL	DISCHARG	DEPTH FIRST OPENING	BOTTOM LAST OPENING	MIN OPEN DIA	OPEN-ING LENGT	TYPE OPEN -ING	TYPE OPEN MAT	BEDROCK DEPTH	BEDROCK MATERIAL	DEPTH DRILLER LOG
30521	135.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30522	25.00	M	5.00	24.00	10/14/1978	45.50	312.00	53.00	63.00	24.0	10.0	S		0.00		68.00
30523	50.00	M	10.00	14.00	06/23/1977	26.00	140.00	46.50	61.50	12.0	15.0	L	R	0.00		62.00
30524	20.00	M	10.00	23.00	10/08/1979	41.00	154.00	57.00	67.00	12.0	10.0	S	R	0.00		66.00
30525	100.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30526	80.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30527	80.00	M	10.00	4.00	02/10/1951	180.00	20.00	33.00	702.00	8.0	679.0	S		0.00		705.00
30528	95.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30529	90.00	M	5.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30530	180.00	M	10.00	250.00	12/02/1959	0.00	0.00	32.00	805.00	10.0	773.0	S		0.00		805.00
30531	125.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30532	140.00	M	10.00	11.00	02/09/1960	250.00	90.00	59.00	486.00	10.0	427.0	S		0.00		486.00
30533	130.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30534	10.00	M	5.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30535*	170.00	M	10.00	0.00	08/20/1959	250.00	60.00	34.00	703.00	10.0	669.0	S		0.00		703.00
30536	100.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30537	65.00	M	5.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30538	130.00	M	5.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30539	120.00	M	5.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30540	40.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30541	17.00	L	1.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30542	5.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30543	24.76	L	0.10	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30544	20.00	L	1.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30545	20.00	L	1.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30546	22.00	L	1.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30547	26.00	L	0.10	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30548	16.92	L	0.10	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00
30549	23.00	M	5.00	10.73	/ /	55.13	430.00	70.00	111.00	10.0	41.0	R	R	0.00		137.00
30550	60.00	M	10.00	20.00	08/31/1950	140.00	226.00	0.00	0.00	0.0	0.0			0.00		326.00
30551	47.00	M	5.00	92.42	03/01/1980	111.75	825.00	155.00	208.00	12.0	53.0	S	S	0.00		0.00
30552	105.00	M	5.00	37.00	05/01/1979	55.50	1536.00	116.00	166.00	16.0	50.0	R	R	0.00		0.00
30553	125.00	M	10.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		464.00
30554	100.00	M	5.00	103.50	04/21/1980	180.00	1455.00	213.00	286.00	12.0	73.0	R	R	0.00		309.00
30555	135.00	M	10.00	0.00	/ /	0.00	0.00	168.00	200.00	12.0	32.0	R	R	0.00		383.00
30556	137.00	A	5.00	0.00	/ /	0.00	0.00	160.00	215.00	6.0	55.0	S	P	0.00		440.00
30557	20.00	M	5.00	5.00	09/21/1979	46.00	300.00	48.00	58.00	12.0	10.0	R	R	0.00		58.00
30558	0.00		0.00	0.00	/ /	0.00	10.00	0.00	0.00	0.0	0.0			0.00		0.00
30559	0.00		0.00	0.00	/ /	0.00	34.00	0.00	0.00	0.0	0.0			0.00		0.00
30560	0.00		0.00	0.00	/ /	0.00	35.00	0.00	0.00	0.0	0.0			0.00		0.00
30561	0.00		0.00	0.00	/ /	0.00	34.00	0.00	0.00	0.0	0.0			0.00		0.00
30562	0.00		0.00	0.00	/ /	0.00	6.00	0.00	0.00	0.0	0.0			0.00		0.00
30563	0.00		0.00	0.00	/ /	0.00	0.00	0.00	0.00	0.0	0.0			0.00		0.00

* nearest public supply well (not currently used, see Ref 24)

SELECTED INFORMATION FROM WELLS IN THE GROUND WATER SITE INVENTORY DATABASE
MIDDLESEX COUNTY

BGS UNIQUE ID	WELL DEPTH	AQUIFER CODE	DATA RELIA-BILITY	HYDRO-LOGIC UNIT	DRILLER	MIN CASING DIA	SITE TYPE	NJDEP PERMIT NUMBER	NJDEP GRID NUMBER	WATER ALLOC NUMBE	STAN INDUS USE	LIFT TYPE	TIME PERIOD PUMPED	SPECIFIC CAPACITY	ALTITUDE WATER LEVEL	MU CI CO
30521	300.00	231BRCK	C	02030105		0.0	W						0.0	0.00	0.00	18
30522	63.00	211CDBG	C	02030105	LAYNE NY CO.	16.0	W					T	24.0	14.51	1.00	24
30523	61.50	211FRNG	U	02030104	LAYNE NY CO	12.0	W					T	8.0	11.67	36.00	16
30524	67.00	211FRNG	U	02030104	SCHULTES, AC	10.0	W	2604798					8.0	8.56	-3.00	16
30525	449.00	231BRCK	C	02030105		0.0	W						0.0	0.00	0.00	18
30526	508.00	231BRCK	C	02030105		0.0	W						0.0	0.00	0.00	21
30527	702.00	231BRCK	C	02030105	STOTHOFF, HJ	8.0	W					T	8.0	0.11	76.00	21
30528	220.00	211MRPA	C	02030105		0.0	W						0.0	0.00	0.00	21
30529	0.00	211FRNG	C	02030105		0.0	W						0.0	0.00	0.00	4
30530	805.00	231BRCK	C	02030105	STOTHOFF	10.0	W				4941		0.0	0.00	-70.00	21
30531	0.00	231BRCK	C	02030105		0.0	W						0.0	0.00	0.00	21
30532	486.00	231BRCK	C	02030105	STOTHOFF	10.0	W				4941		8.0	0.38	129.00	21
30533	400.00	231BRCK	C	02030105		0.0	W						0.0	0.00	0.00	21
30534	0.00	211CDBG	C	02030105		0.0	W				4941		0.0	0.00	0.00	9
30535*	703.00	231BRCK	C	02030105	STOTHOFF	10.0	W				4941		8.0	0.00	170.00	21
30536	0.00	231BRCK	C	02030105		0.0	W						0.0	0.00	0.00	15
30537	300.00	231BRCK	C	02030105		0.0	W						0.0	0.00	0.00	12
30538	146.00	211CDBG	C	02030105		0.0	W			2122P			0.0	0.00	0.00	19
30539	225.00	211MRPA	C	02030105		0.0	W						0.0	0.00	0.00	14
30540	601.00	231BRCK	C	02030105		0.0	W						0.0	0.00	0.00	15
30541	36.00	211FRNG	C	02030104		0.0	W						0.0	0.00	0.00	25
30542	22.00	211FRNG	C	02030104		0.0	W						0.0	0.00	0.00	25
30543	42.00	211FRNG	C	02030104		0.0	W						0.0	0.00	0.00	25
30544	28.50	211FRNG	C	02030104		0.0	W						0.0	0.00	0.00	25
30545	44.50	211FRNG	C	02030104		0.0	W						0.0	0.00	0.00	25
30546	45.00	211FRNG	C	02030104		0.0	W						0.0	0.00	0.00	25
30547	43.00	211FRNG	C	02030104		0.0	W						0.0	0.00	0.00	25
30548	36.00	211FRNG	C	02030104		0.0	W						0.0	0.00	0.00	25
30549	111.00	211CDBG	C	02040301	SCHULTES, AC	10.0	W	2910500	2901226	01597	4941	T	24.0	9.68	12.27	19
30550	325.00	231BRCK	C	02030105	STOTHOFF, HJ	10.0	W					T	22.0	1.88	40.00	3
30551	208.00	211FRNG	C	02030105	SCHULTES, AC	12.0	W	2811524			4941	T	24.0	42.68	-45.42	23
30552	166.00	211FRNG	C	02030105	LAYNE NY CO	16.0	W				4941		8.0	83.03	68.00	21
30553	0.00	211FRNG	C	02030105	SCHULTES, AC	0.0	W						0.0	0.00	0.00	13
30554	286.00	211FRNG	C	02030104	SCHULTES, AC	12.0	W				4941	T	24.0	19.02	-3.50	19
30555	200.00	211CDBG	C	02030105	SCHULTES, AC	12.0	W	2811720					0.0	0.00	0.00	13
30556	215.00	211CDBG	C	02030105	SCHULTES, AC	6.0	W	2811719					0.0	0.00	0.00	13
30557	58.00	211CDBG	C	02030105	LAYNE NY CO	12.0	W	2604812			4941	T	8.0	7.32	15.00	19
30558	302.00	231BRCK	U	02030104		6.0	W						0.0	0.00	0.00	25
30559	614.00	231BRCK	U	02030104		0.0	W						0.0	0.00	0.00	25
30560	405.00	231BRCK	U	02030104		8.0	W						0.0	0.00	0.00	25
30561	614.00	231BRCK	U	02030104		0.0	W						0.0	0.00	0.00	5
30562	111.00	231BRCK	U	02030104		6.0	W						0.0	0.00	0.00	5
30563	260.00	211FRNG	U	02030105		0.0	W				4941		0.0	0.00	0.00	48

* Municipal Pub'c Supply well (not currently used, see Ref. 24)

REFERENCE NO. 26

SURFACE WATER QUALITY STANDARDS

N.J.A.C. 7:9-4.1 et seq.

May 1985

New Jersey Department of Environmental Protection/Division of Water Resources

specified test conditions, based on the results of an acute bioassay.

"Limiting nutrient" means a nutrient whose absence or scarcity exerts a restraining influence upon an aquatic biological population.

"MA7CD10" means the minimum average 7 consecutive day flow with a statistical recurrence interval of 10 years.

"Measurable changes" means changes measured or determined by a biological, chemical, physical analytical method, conducted in accordance with USEPA approved methods as identified in 40 C.F.R. 136 or other analytical methods (for example, mathematical models, ecological indices, etc.) approved by the Department, that might adversely impact a water use (including, but not limited to aesthetics).

"Mixing zones" means localized areas of surface waters, as may be designated by the Department, into which wastewater effluents may be discharged for the purpose of mixing, dispersing, or dissipating such effluents without creating nuisances or hazardous conditions, or violating the provisions of this subchapter.

"Natural flow" means the water flow that would exist in a waterway without the addition of flow of artificial origin.

"Natural water quality" means the water quality that would exist in a waterway or a waterbody without the addition of water or waterborne substances from artificial origin.

"NJPDES" means New Jersey Pollutant Discharge Elimination System.

"NOEC" means the "no observable effect concentration", which is the highest concentration of a toxic substance that has no adverse effect(s) on survival, growth, or reproduction of species based upon the results of chronic toxicity testing.

"Nondegradation waters" means those waters set aside for posterity because of their clarity, color, scenic setting, other characteristic of aesthetic value, unique ecological significance, exceptional recreational significance, or exceptional water supply significance. These waters include all waters designated as FW1 in this subchapter.

"Nonpersistent" means degrading relatively quickly, generally having a half-life of less than 96 hours.

"Nontrout waters" means fresh waters that have not been designated in this subchapter as trout production or trout maintenance. These waters are generally not suitable for trout because of their physical, chemical, or biological

characteristics, but are suitable for a wide variety of other fish species.

"NPDES" means National Pollutant Discharge Elimination System.

"NT" means nontrout waters.

"Nutrient" means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the growth and development of organisms.

"Outstanding National Resource Waters" means high quality waters that constitute an outstanding national resource (for example, waters of National/State Parks and Wildlife Refuges and waters of exceptional recreational or ecological significance) as designated in Index G incorporated into this subchapter.

"Persistent" means relatively resistant to degradation, generally having a half life of over 96 hours.

"Pinelands waters" means all waters within the boundaries of the Pineland Area, except those waters designated as FW1 in this subchapter, as established in the Pinelands Protection Act N.J.S.A. 13:18A-1 et seq. and shown on Plate 1 of the "Comprehensive Management Plan" adopted by the New Jersey Pinelands Commission in November 1980.

"PL" means the general surface water classification applied to Pinelands Waters.

"Primary contact recreation" means recreational activities that involve significant ingestion risks and includes, but is not limited to, wading, swimming, diving, surfing, and water skiing.

"Public hearing" means a legislative type hearing before a representative or representatives of the Department providing the opportunity for public comment, but does not include cross-examination.

"River mile" means the distance, measured in statute miles, between two locations on a stream, with the first location designated as mile zero. Mile zero for the Delaware River is located at the intersection of the centerline of the navigation channel and a line between the Cape May Light, New Jersey, and the tip of Cape Henlopen, Delaware.

"Saline waters" means waters having salinities generally greater than 3.5 parts per thousand at mean high tide.

"SC" means the general surface water classification applied to coastal saline waters.

"SE" means the general surface water classification applied to saline waters of estuaries.

propagation of fish, shellfish, and wildlife, and recreation in and on the water, which are not included in the designated uses listed in this subchapter are attainable.

(f) A reclassification for more restrictive uses may be made when:

1. It is demonstrated to the satisfaction of the Department that the waters should be set aside to represent the natural aquatic environment and its associated biota; or

2. It is demonstrated to the satisfaction of the Department that a more restrictive use is necessary to protect a unique ecological system or threatened/endangered species.

(g) In those cases in which a thermal discharge is involved, the procedures for reclassifying segments for more restrictive uses shall be consistent with section 316 of the Federal Clean Water Act.

7:9-4.12 Designated uses of FW1, PL, FW2, SE1, SE2, SE3, and SC Waters

(a) In all FW1 waters the designated uses are:

1. Set aside for posterity to represent the natural aquatic environment and its associated biota;

2. Primary and secondary contact recreation;

3. Maintenance, migration and propagation of the natural and established aquatic biota; and

4. Any other reasonable uses.

(b) In all PL waters the designated uses are:

1. Cranberry bog water supply and other agricultural uses;

2. Maintenance, migration and propagation of the natural and established biota indigenous to this unique ecological system;

3. Public potable water supply after such treatment as required by law or regulations;

4. Primary and secondary contact recreation; and

5. Any other reasonable uses.

✳ (c) In all FW2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;

2. Primary and secondary contact recreation;

3. Industrial and agricultural water supply;

4. Public potable water supply after such treatment as required by law or regulation; and

5. Any other reasonable uses.

(d) In all SE1 waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

2. Maintenance, migration and propagation of the natural and established biota;

3. Primary and secondary contact recreation; and

4. Any other reasonable uses.

(e) In all SE2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;

2. Migration of diadromous fish;

3. Maintenance of wildlife;

4. Secondary contact recreation; and

5. Any other reasonable uses.

(f) In all SE3 waters the designated uses are:

1. Secondary contact recreation;

2. Maintenance and migration of fish populations;

3. Migration of diadromous fish;

4. Maintenance of wildlife; and

5. Any other reasonable uses.

(g) In all SC waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

Surface Water Classifications

Surface Water Quality Standards
N.J.A.C. 7:9-4

Index E-

Surface Water Classifications of the Raritan River and Raritan Bay Basin

May 1985

State of New Jersey Department of Environmental Protection/Division of Water Resources

LAWRENCE BROOK	
(Deans) - Source to the intake of the New Brunswick Water Department at Weston's Mill Dam	FW2-NT
(New Brunswick) - Weston's Mill Dam to Raritan River	SE1
LEDGEWOOD BROOK (Ledgewood) - Entire length	FW2-TP(C1)
LITTLE BROOK (Califon) - Entire length	FW2-TP(C1)
LITTLE SILVER CREEK	
(Shreswbury) - Source to a line beginning on the eastern bank of that unnamed lagoon located between Wardell Ave. and Oakes Rd. in Rumson and bearing approximately 171 degrees T (True North) to its terminus on the south shore of Little Silver Creek	FW2-NT/SE1
(Rumson) - Creek below line described above	SE1(C1)
LOMERSON BROOK - See HERZOG BROOK	
MANALAPAN BROOK	
(Jamesburg) - Source to Duhernal Lake dam, except tributary described separately below	FW2-NT
(Tennent) - That portion of the tributary at Tennent along the boundary of Monmouth Battlefield State Park	FW2-NT(C1)
MATCHAPONIX BROOK [WEAMACONK CREEK]	
(Mount Mills) - Entire length, except segments described below	FW2-NT
(Freehold) - The brook and tributaries within the boundaries of Monmouth Battlefield State Park	FW2-NT(C1)
MCGELLAIRDS BROOK	
(Englishtown) - Entire length, except tributary described separately below	FW2-NT
(Freehold) - Tributary within Monmouth Battlefield State Park	FW2-NT(C1)
MCVICKERS BROOK (Mendham) - Entire length	FW2-TM(C1)
MIDDLE BROOK (Greater Cross Roads) - Entire length	FW2-NT
MIDDLE BROOK	
EAST BRANCH	
(Springdale) - Entire length	FW2-TM
WEST BRANCH	
(Martinsville) - Entire length	FW2-NT
MAIN STEM	
(Bound Brook) - Confluence of East and West branches to Raritan River	FW2-NT
MILFORD BROOK (Lafayette Mills) - Entire length	FW2-NT
MILLSTONE RIVER (Hightstown) - Entire length	FW2-NT
MINE BROOK (Mine Brook) - Entire length	FW2-NT
MINE BROOK (Colts Neck) - Entire length	FW2-NT
MULHOCKAWAY CREEK (Pattenburg) - Entire length	FW2-TP(C1)

NAVESINK RIVER (Red Bank) - Source to a line starting at a point at the northeast end of Blossom Cove, bearing approximately 142 degrees T (True North), through navigational aid C23 to the south bank near Riverview Hospital	SE1
(Rumson) - River southeast of the line described above, except segment described below	SE1(C1)
(Monmouth Beach) - All waters south and east of a line beginning on the northwesternmost point of land on Racoon Island (in the vicinity of the western extent of Highland Ave.) in Monmouth Beach, and bearing approximately 056 degrees T (True North) to the southernmost point of a small unnamed island, and then bearing approximately 091 degrees T to its terminus on the northernmost point of land located at the northern extent of Monmouth Parkway in Monmouth Beach and all waters south of a line beginning on the western shoreline (just east of Monmouth Parkway in Monmouth Beach) and bearing approximately 081 degrees T, intersecting Channel Marker Flashing Red 4 and Channel Marker Flashing Red 2 and terminating on the eastern shoreline of the Galilee section of Monmouth Beach.	SE1
NESHANIC RIVER (Reaville) - Entire length	FW2-NT
NORTON BROOK (Norton) - Entire length	FW2-TP(C1)
OAKDALE CREEK (Chester) - Entire length	FW2-TP(C1)
* OAKEYS BROOK (Deans) - Entire length	FW2-NT
OCEANPORT CREEK (Fort Monmouth) - Source to a line beginning on the easternmost extent of Horseneck Point and bearing approximately 140 degrees True North to its terminus on the westernmost extent of an unnamed point of land located at the westernmost extent of Monmouth Boulevard in Oceanport	FW2-NT/SE1
(Oceanport) - Creek downstream of line described above	SE1(C1)
PARKERS CREEK (Fort Monmouth) - Source to a line beginning on the easternmost extent of Horseneck Point and bearing apprixmately 000 degrees True North to its terminus on Breezy Point on the Little Silver side (north) side of the creek.	FW2-NT/SE1
(Fort Monmouth) - Creek downstream of line described above	SE1(C1)
PEAPACK BROOK (Gladstone) - Entire length	FW2-TP(C1)
PETERS BROOK (Somerville) - Entire length	FW2-NT

PIGEON SWAMP (S. Brunswick) - All waters within the boundaries of Pigeon Swamp State Park	FW2-NT(C1)
PIKE RUN (Belle Meade) - Entire length	FW2-NT
PINE BROOK (Clarks Mills) - Entire length	FW2-NT
PINE BROOK (Cooks Mill) - Entire length	FW2-TM
PLEASANT RUN (Readington) - Entire length	FW2-NT
PRESCOTT BROOK (Stanton Station) - Entire length	FW2-TM
RAMANESSIN [HOP] BROOK (Holmdel) - Entire length	FW2-TM
RARITAN BAY - Entire Drainage	FW2-NT/SE1
RARITAN RIVER	
NORTH BRANCH (Also see INDIA BROOK)	
(Pleasant Valley) - Source to, but not including, Ravine Lake	FW2-TP(C1)
(Far Hills) - Ravine Lake dam to Rt. 512 bridge	FW2-TM
(Bedminster) - Rt. 512 bridge to confluence with South Branch, Raritan River	FW2-NT
SOUTH BRANCH RARITAN RIVER	
(Mt. Olive) - Source to the dam that is 390 feet upstream of the Flanders-Drakestown Road bridge	FW2-NT(C1)
(Mt. Olive) - Dam to confluence with Turkey Brook	FW2-TM(C1)
(Naughright) - Confluence with Turkey Brook to confluence with Electric Brook	FW2-TP(C1)
(Clinton) - Confluence with Electric Brook to downstream end of Packers Island, except segment described separately, below	FW2-TM
(Ken Lockwood Gorge) - River and tributaries within Ken Lockwood Gorge Wildlife Management Area	FW2-TM(C1)
(Neshanic Sta.) - Downstream end of Packers Island to confluence with North Branch, Raritan River	FW2-NT
MAIN STEM RARITAN RIVER	
(Bound Brook) - From confluence of North and South Branches to Landing Lane bridge in New Brunswick and all freshwater tributaries downstream of Landing Lane bridge.	FW2-NT
(Sayreville) - Landing Lane bridge to Raritan Bay and all saline water tributaries	SE1
RINEHART BROOK (Hacklebarney) - Entire length	FW2-TP(C1)
ROCK BROOK (Montgomery) - Entire length	FW2-NT
ROCKAWAY CREEK	
NORTH BRANCH	
(Mountainville) - Source to Rt. 523 bridge	FW2-TP(C1)
(Whitehouse) - Rt. 523 bridge to confluence with South Branch	FW2-TM

REFERENCE NO. 27

TERRESTRIAL ORGANISMS

Shown in BROWN: species with special status shown in RED-(F) or (S) indicates species protected by Federal or State Legislation (see text)

SYMBOL — SPECIES

PLANTS (301–350)

301 Eastern hemlock
302 Spleenwort (S)
303 Spider lily (S)
304 Pond bush (S)
305 Watermilfoil (S)
306 Hooded pitcher plant (S)
307 Tree
308 Prickly pear cactus (S)
309 Trailing arbutus (S)
310 Eastern bumelia
311 Pitcher plant
312 Baldcypress
313 Redbay
314 Seaside alder
315 Box huckleberry
316 Purple fringeless orchid
317 Pink lady's slipper
318 Ebony spleenwort (S)
319 Orchids (S)
320 Golden club (S)
321 Florida beargrass
322 East-coast coontie
323 Fall-flowering ixia
324 Jackson-vine
325 Spoon-flower
326 Curtiss milkweed
327 Sea lavender
328 Hand fern
329 Needle palm
330 Yellow squirrel-banana
331 Beach creeper
332 Florida coontie
333 Four-petal pawpaw
334 Bird's nest spleenwort
335 Burrowing four-o'clock
336 Beach star
337 Silver palm
338 Dancing lady orchid
339 Tamarindillo
340 Fuch's bromeliad
341 Everglades peperomia
342 Buccaneer palm
343 Slender spleenwort
344 Pineland jacquemontia
345 Mahogany mistletoe
346 Florida thatch
347 Twisted air plant
348 Long's bittercress
349 Venus's flytrap

INVERTEBRATES (351–400)

351 Monarch butterfly
352 Zebra butterfly

BIRDS (401–600)

SHOREBIRDS (401–430)

401 Shorebirds
402 Terns
403 Gulls
404 Forster's tern
405 Arctic tern
406 Least tern (S)
407 Roseate tern (S)
408 Common tern
409 Great black-backed gull
410 Herring gull
411 Laughing gull
412 Black skimmer (S)
413 Turnstones
414 Plovers
415 Piping plover
416 American oystercatcher (S)

WADING BIRDS (431–460)

431 Wading birds
432 Herons
433 Egrets
434 Rails
435 Ibises
436 Bitterns
437 Great blue heron (S)
438 Wood ibis (S)
439 Anhinga
440 Little blue heron (S)
441 Yellow-crowned night heron (S)
442 Black-crowned night heron
443 Florida sandhill crane (S)
444 Louisiana heron (S)
445 Limpkin (S)
446 Roseate spoonbill (S)
447 Snowy egret (S)
448 Magnificent frigate-bird (S)
449 Reddish egret (S)
450 Clapper rail
451 King rail
452 Virginia rail
453 Sora rail

WATERFOWL (461–500)

461 Waterfowl
462 Swans
463 Geese
464 Dabbling ducks
465 Diving ducks

Newark

N. J.—N. Y.—PA.

1:250 000-scale map of

Atlantic Coast Ecological Inventory

Produced by

U. S. FISH AND WILDLIFE SERVICE

1980

AQUATIC ORGANISMS

Shown in BLUE: species with special status shown in RED-(F) or (S) indicates species protected by Federal or State Legislation (see text)

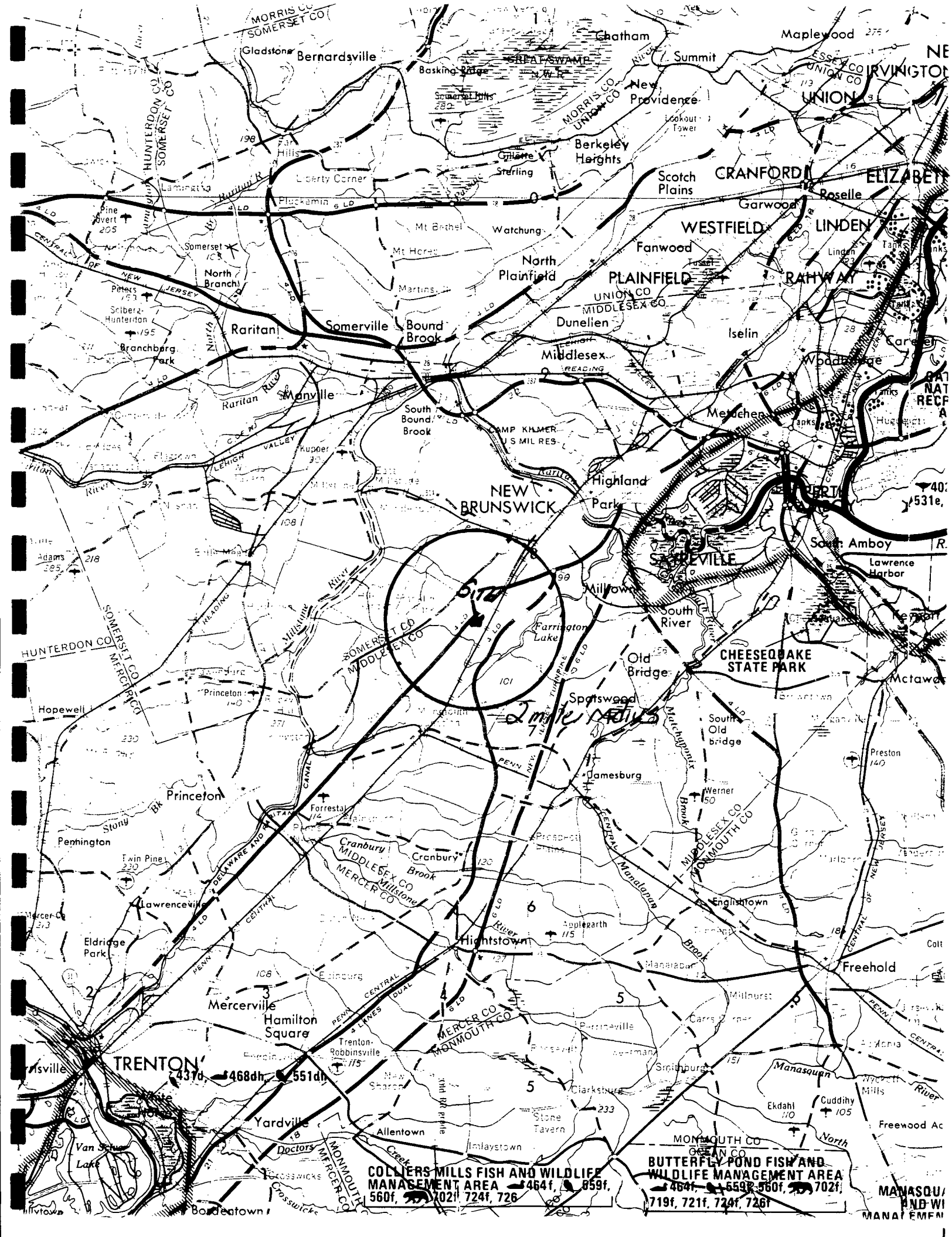
SYMBOL — SPECIES

PLANTS (1–50)

1 Irish moss
2 Rockweed

INVERTEBRATES (51–100)

51 Crabs
52 Mussels
53 Oysters
54 Scallops
55 Clams
56 Worms
57 Shrimp
58 American lobster
59 Blue crab
60 Eastern oyster
61 European oyster
62 Bay scallop
63 Deep-sea scallop


Chatham
Maplewood
Gladstone
Bernardsville
Basking Ridge
GREAT SWAMP N W R
Summit
New Providence
UNION
Berkeley Heights
Scotch Plains
CRANFORD
Roselle
Garwood
WESTFIELD
LINDEN
Fanwood
North Plainfield
PLAINFIELD
RAHWAY
Somerset
North Branch
Raritan
Somerville
Bound Brook
Dunellen
Iselin
Middlesex
Manville
South Bound Brook
CAMP KILMER U S MIL RES
Metuchen
NEW BRUNSWICK
Highland Park
South Amboy
SAYREVILLE
Lawrence Harbor
Milltown
South River
Farrington Lake
Old Bridge
CHEESEQUAKE STATE PARK
Hopewell
Princeton
Spotswood
South Old bridge
Jamesburg
Preston
Pennington
Forrestal
Cranbury
Cranbury Brook
Lawrenceville
Englishtown
Eldridge Park
Hightstown
Freehold
Mercerville
Hamilton Square
TRENTON
Trenton-Robbinsville
Millhurst
Manasquan
Yardville
Allentown
Clarksburg
Stone Tavern
Ekdahl
Cuddihy
Freewood Acres
Van Sciver Lake
Doctors Creek
Crosswicks
Bordentown
COLLIERS MILLS FISH AND WILDLIFE MANAGEMENT AREA
BUTTERFLY POND FISH AND WILDLIFE MANAGEMENT AREA
HUNTERDON CO
SOMERSET CO
MORRIS CO
UNION CO
MIDDLESEX CO
MERCER CO
MONMOUTH CO
OCEAN CO

REFERENCE NO. 28

GSC-TR8645

GRAPHICAL EXPOSURE MODELING SYSTEM

(GEMS)

USER'S GUIDE

VOLUME 2. MODELING

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GEMS> I

EASTERN SURGICAL DRESSING PLT JJP INC ,
LATITUDE 40:26:11 LONGITUDE 74:30:16 1980 POPULATION

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	382	3803	4251	14954	26549	49939
RING TOTALS	0	382	3803	4251	14954	26549	49939

GEMS> I

EASTERN SURGICAL DRESSING PLT JJP INC
LATITUDE 40:26:11 LONGITUDE 74:30:16 1980 HOUSING

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	115	1445	1167	5134	9059	16920
RING TOTALS	0	115	1445	1167	5134	9059	16920

Distance (Miles)	Population	Housing
0.25	0	0
0.5	382	115
1	4185	1560
2	8436	2727
3	23390	7861
4	49939	16920